

MAY 23, 1960

# PURCHASING

The Methods and News Magazine for Industrial Buyers



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Manufacturing operations have begun at Century Electric Company's new 100,000-square-foot McMinnville Plant. Built to meet the growing demand for Century's expanding production of fractional horsepower motors, the new plant has the latest developments in continuous-flow assembly and manufacture.

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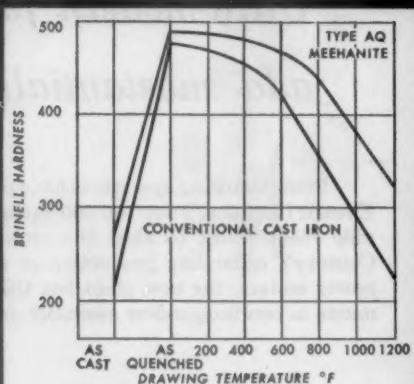
The addition of these new and modern production facilities at McMinnville, Tennessee, completes another step in Century Electric Company's progressive series of plans for the future.

**CENTURY ELECTRIC COMPANY**  
**St. Louis 3, Missouri Offices and Stock Points in Principal Cities**

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DIMENSIONAL  
TOLERANCES  
CAN BE HELD  
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it maintains its high hardness even when heated. For this reason, AQ Meehanite castings can be expected to provide good wear resistance where conventional flame hardened parts may soften under repeated temperature influence. See chart above. Large castings can be fully hardened . . . simply . . . economically . . . without oil bath equipment . . . and without dangerous distortions.

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You'll like doing business with a Meehanite foundry.

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Palmyra Foundry Co., Inc., Palmyra, N. J.  
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Sonith Foundries of FMC, Indianapolis, Ind.  
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## Piston-packing belt helps build new cars

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When a B.F. Goodrich distributor heard of the problem, he recommended a new B.F. Goodrich conveyor belt made of Koroseal flexible material. Koroseal resists scuffing, tearing, cutting; it stands oil, grease, most acids and just about everything else that ruins other materials. It can be vul-

canized into a continuous belt, eliminating troublesome fasteners.

After a year's service, the Koroseal belt was still going strong—had lasted three times longer than the belt it replaced—carried over 2 million pistons. Even though this is a premium-priced belt, its cost when measured in terms of useful service is 48% lower than the belting it replaced.

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factory-trained specialist in rubber products, he can answer your questions about the many products B.F. Goodrich makes for industry. *B. F. Goodrich Industrial Products Company, Department M-838, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

**B.F.Goodrich**  
**CONVEYOR BELTS**

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MAY 23, 1960



Now we're set for a big  
future! Thanks for insisting!

Graybar

Include the Graybar man in your electrical planning.

The recommendation he makes comes from experience with countless kinds of power distribution equipment, motors, controls, wiring and lighting supplies.

Call Graybar for impartial recommendations . . . and able, *in-the-plant* help. We'll work with you or your electrical contractor.

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# PURCHASING

The Methods and News Magazine For Industrial Buyers

MAY 23, 1960  
VOLUME 48, No. 11

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MAY 23, 1960

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PURCHASING

## Pulse of Business

### Business On A Plateau

### Retail Sales Rise 3%

THE RECENT release of important business statistics indicates the direction of the economy for the next few months: No recession and steady progress along a relatively high plateau.

To those who predicted a boom year at the beginning of 1960, these indications can be taken as bad news. But to most businessmen, it means that it will be a good year, that may yet top 1959.

Analyze some of the figures issued by the government and trade associations and you'll see how the business picture looks today. For example:

**Retail Sales**—Seasonally-adjusted retail sales last month shot up 3% from the March level of \$18.9 billion, a new record for the month of April.

This advance, says the Department of Commerce, "reflected in part improved weather conditions throughout the nation and the maintenance of a strong flow of income." Better sales were reported in many consumer durable goods. Apparently consumers got in a buying mood as the weather improved.

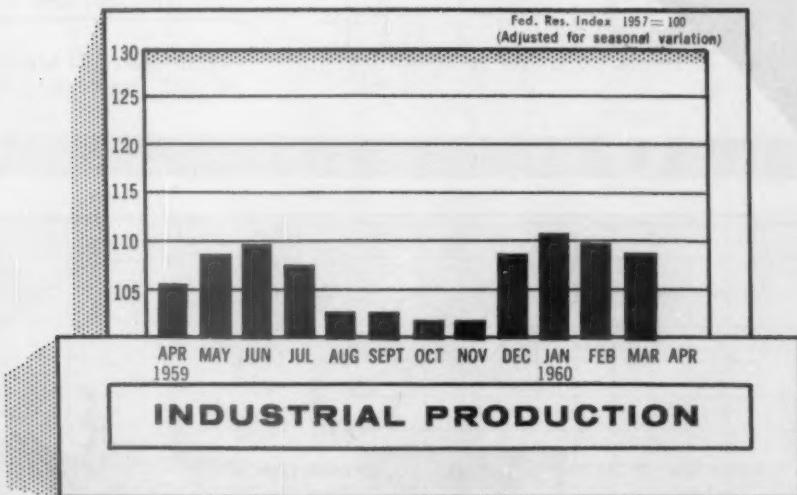
There's a good possibility that May retail sales may decline a bit following this bunching up of orders. But retailers are anticipating that consumer confidence throughout the summer will keep sales moving steadily along.

**Consumer Credit**—Consumer confidence leads to more sales, which usually leads to increased demand for credit. That's what happened in March when seasonally-adjusted consumer credit rose \$432 million to over \$51 billion.

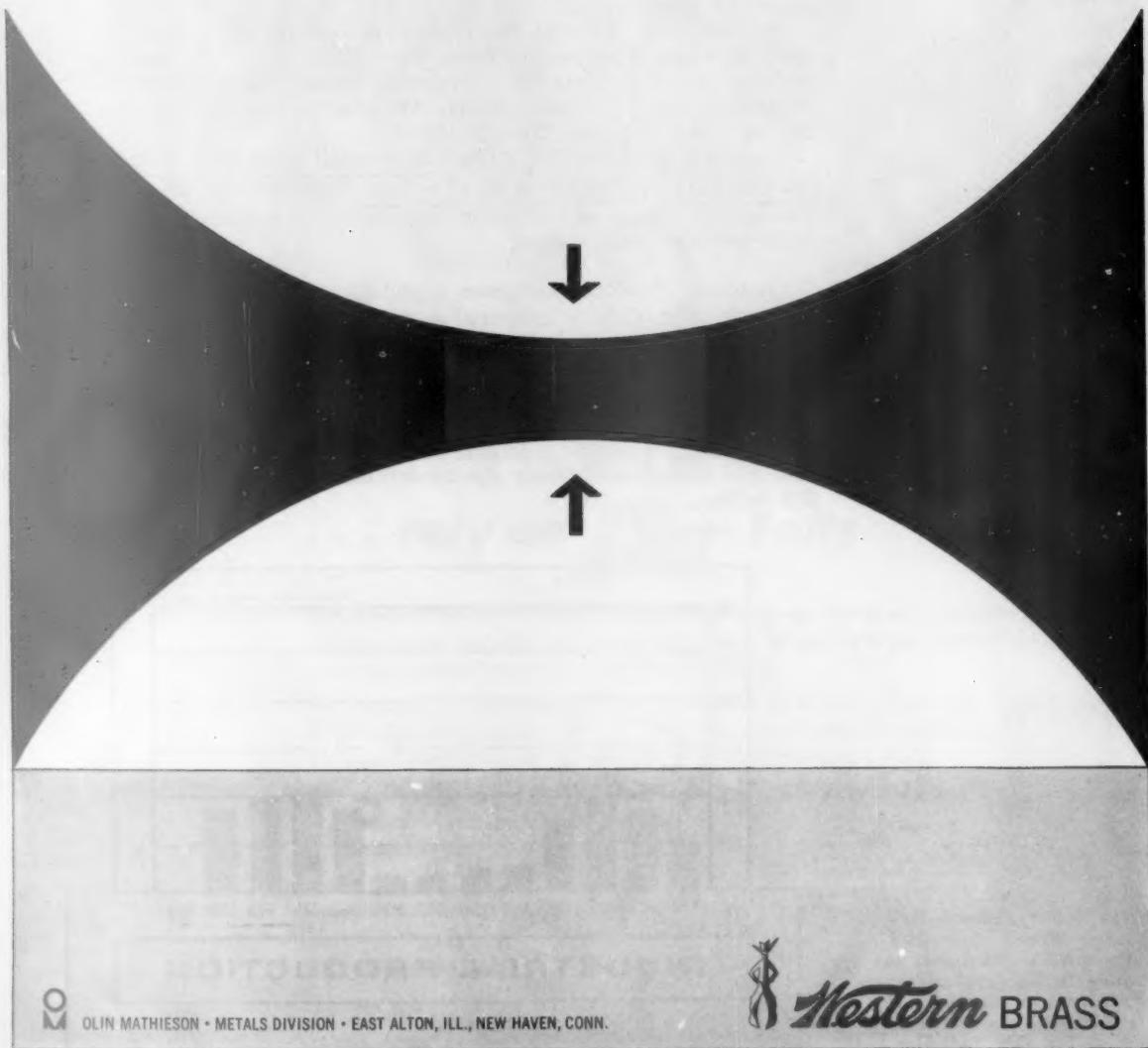
The various forms of installment credit increased \$408 million to \$39.7 billion. Automobile installment loans were up \$210 million, personal loans were \$94 million higher, other consumer goods paper rose \$76 million, and repair and modernization loans were boosted \$28 million.

(Turn Page)

The latest Federal Reserve Board Industrial Production Index fell a point to 109 (1957=100). This marks the second consecutive one point drop for this indicator.



You'll make better connections with **Western Brass**, because brass is easily—and firmly—welded, brazed, or soldered. With Western Brass you have the added confidence that comes from working with metallurgical specialists who analyze your blueprints to guarantee that you get sheet or strip in the right alloy, temper, grain size, gauge, and finish. You'll make it better with easy-to-bond brass. And you'll make it best with Western Brass—it's "tailor-made" to your individual requirements.



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*Western* BRASS

## Pulse of Business

**Machine Tools**—New orders for metal cutting machine tools advanced in each of the first three months of 1960. Orders were at an annual rate of \$560,000,000—up 10% from \$509 million last year. Nevertheless, the industry is operating at a level far below its productive capacity.

Export orders represented almost a quarter of the total new business booked in the first quarter. This is a big jump over the last five years, when export orders topped 15% of the total only once. The bulk of current sales to overseas countries are of special purpose tools, where American know-how more than offsets lower foreign wages.

**Foreign Trade**—Both exports and imports rose in March over the levels of the previous month. In fact, exports hit a mark that had not been reached for the last three years.

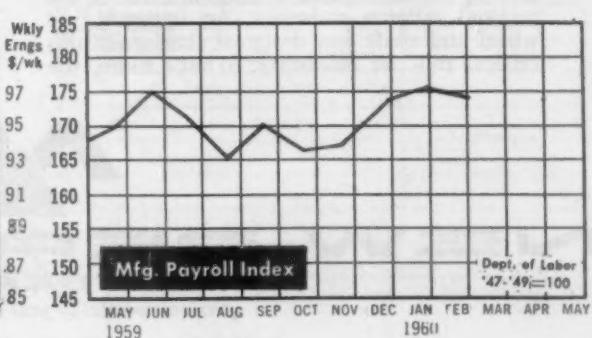
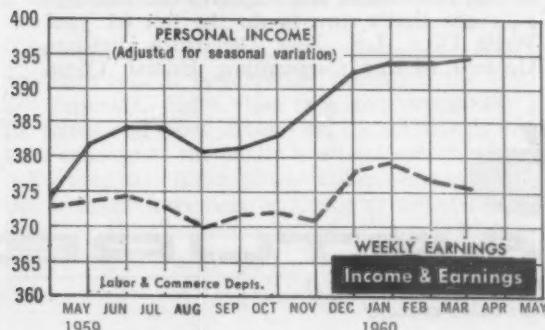
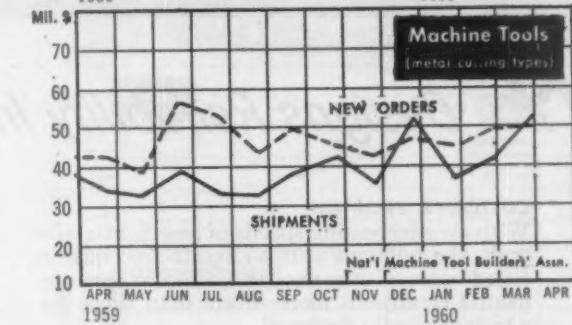
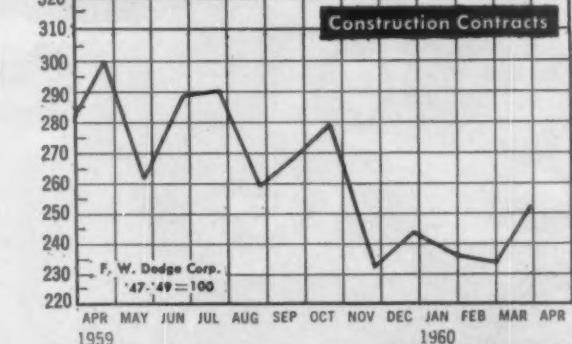
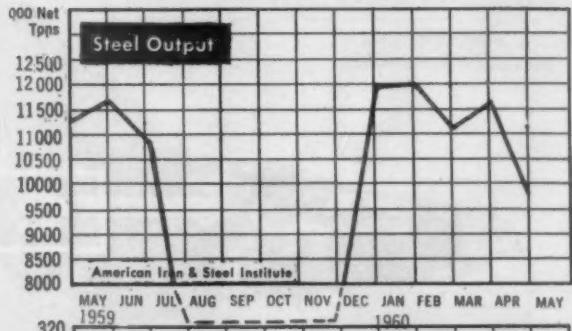
Total commercial exports were \$1,670,000,000, up 12% from the previous month. This brought first quarter exports up to \$4,651,000,000—a 21% advance over the first three months of 1959.

Imports edged upward on a slightly smaller scale. Purchases from abroad were \$1,355,000,000, about 5% higher than the previous month. Through March, imports have also been running ahead of the 1959 performance record.

**Construction**—March construction contract awards fell behind the level of a year ago. But, says the F. W. Dodge Corp., the statistics show some improvement over the first two months of the year.

The awards, which indicate the pace of future construction activity, dropped 9% in

### INDUSTRY SPOTLIGHT





## CASE HISTORIES



N/D integral rolleron gyro wheel and shaft with precision instrument ball bearing solves sidewinder reliability problem. Actual ball bearing O.D. measures little more than an inch.

### **ND** Designs Reliability Into Sidewinder Rollerons!

#### **CUSTOMER PROBLEM:**

With ever-increasing speeds of new fighter aircraft, the rollerons of this aircraft-fired missile failed because they were subjected to environmental conditions more severe than those for which originally designed.

#### **SOLUTION:**

New Departure engineers in conjunction with Naval Ordnance Test Station solved the problem by recommending a simplification of the original rolleron assembly. An integral gyro wheel and shaft was designed that maintains critical rolleron reliability. What's more, the

new design reduces inventories, assembly time and inspections. And today, this same N/D creative engineering and reliability can be found in more than twenty of America's major missiles . . . in airframe, guidance, propulsion and ground support.

If your product has unusual ball bearing demands, call in a New Departure Sales Engineer. He's armed with a complete line of Miniature, Instrument and standard ball bearings . . . one that's sure to do the job for you! Write Dept. L.S., New Departure Division, General Motors Corporation, Bristol, Conn.

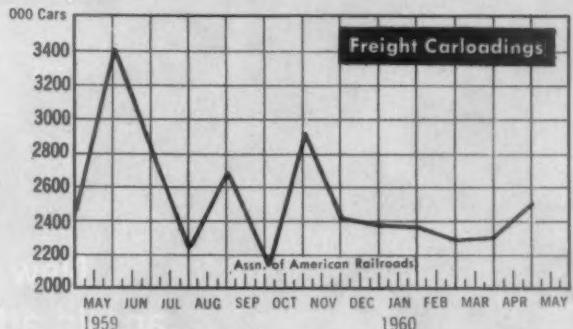
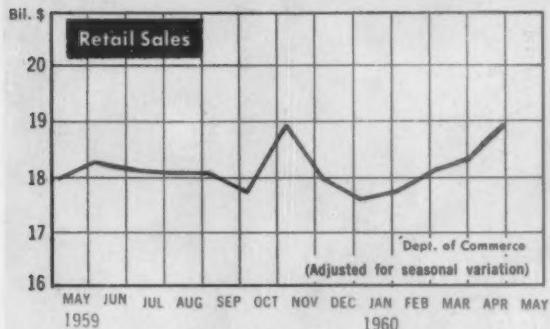


**NEW DEPARTURE**  
**BALL BEARINGS**  
*proved reliability you can build around*

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## Pulse of Business

### TRADE



March to \$3,046,345,000, with housing again leading the decline. In the first quarter, total contracts, at \$7,457,691,000, were 6% below the same period of 1959.

**Personal Income**—Latest personal income figures show a \$500 million monthly rise to a seasonally-adjusted annual rate of \$393.5 billion. Wage and salary disbursements—at an annual rate of \$269 billion—were up \$200 million. In addition, there was a rise noted in government payrolls.

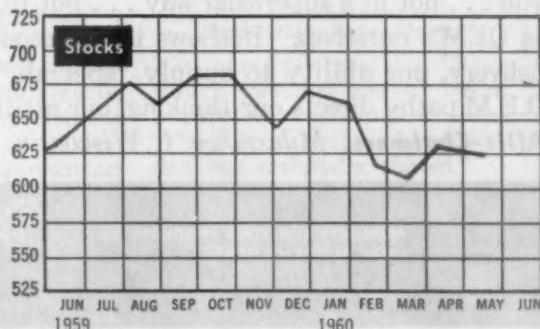
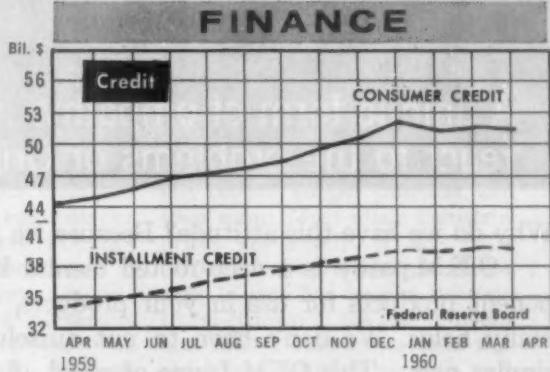
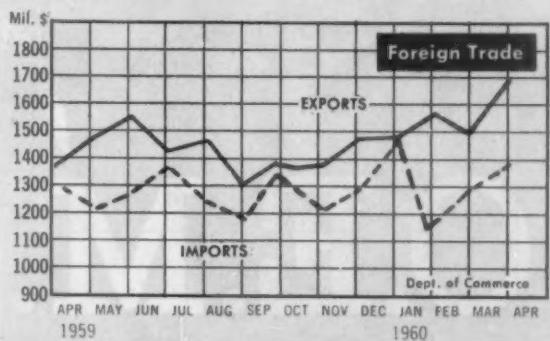
A number of important industries had lower wage disbursements. Among them were construction, automobiles, aircraft, metals, and building materials.

**Automobile Sales**—New car sales rose again last month to 578,680 units. This figure is 4.4% above the previous month and a sharp 14.9% above April 1959.

This month, the auto industry plans to turn out 613,000 passenger cars. A brisk selling pace for the '60 models in the summer could give the economy an extra lift in the months ahead. Sales of the compact cars are expected to total 25% of all sales in this model year.

Of course, the steel industry certainly hopes new cars sell. It is currently operating far below capacity. Since steel is a key commodity for autos and most industries, its activity is of vital concern to the entire business community.

Fortunately, most of the other segments of the economy have been enjoying excellent business. If they continue to do so, employment and profits will stay high.



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an old attitude  
at Allis-Chalmers

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PUMPS



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COMPRESSORS

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## Pulse of Business

### The P.A.'s Outlook

- Most P.A.'s Confident About Business Outlook
- But Buyer Optimism Lower Than Earlier
- N.A.P.A. Report Notes 'Satisfactory Plateau'

**A**LTHOUGH P.A.'s are generally confident about the short-term business outlook, they are not as optimistic on the eve of the N.A.P.A. convention as they were at the beginning of this year.

For instance, PURCHASING Magazine's Business Confidence Index—derived from a sampling of P.A. opinion throughout the country—dropped five points in May. The indicator now stands at 98 (1958=100). While this is at a lower level than the earlier part of 1960, it is still higher than the figures notched in October, November, and December of 1959.

#### Sales Outpacing Profits

Purchasing executives note that while sales are up, profits aren't keeping pace. Thus, the purchasing agent for a New England company observes "volume continues at a good pace, but conditions are so competitive that it is impossible to recover the increased costs—which drastically reduces our profit margins."

Another P.A. for a Michigan manufacturing company points out that business is "leveling off at a relatively high plateau. While we can't get too excited, we certainly are satisfied with present conditions and future prospects."

#### BUSINESS CONFIDENCE INDEX

How P.A.'s feel about the short-term economic outlook.

	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
120	104	111	117	119	120	121	120	120	120	120	120	120	120
115	105	112	118	120	120	120	120	120	120	120	120	120	120
110	101	102	103	104	105	106	107	108	109	110	111	112	113
105	97	98	99	100	101	102	103	104	105	106	107	108	109
100	93	94	95	96	97	98	99	100	101	102	103	104	105
95	89	90	91	92	93	94	95	96	97	98	99	100	101
90	84	85	86	87	88	89	90	91	92	93	94	95	96
85	79	80	81	82	83	84	85	86	87	88	89	90	91
80	74	75	76	77	78	79	80	81	82	83	84	85	86
	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
	1959												

Purchasing Magazine's Business Confidence Index dropped five points in May to 98 (1958=100). This indicator of purchasing agent opinion throughout the nation—derived from a poll of 1000 P.A.'s—indicates the possibility of slightly depressed business conditions in June, July, and August.

Says the N.A.P.A.: "Business has not shown the buoyancy that was expected, but it is continuing on a relatively satisfactory plateau . . . Most of our members now believe their present stocks are in balance and there is no further desire to increase them."

The business survey committee adds "There are numerous reports of local market conditions and specific product developments that are offering real competitive buying opportunities."

The Chicago association notes that "Price levels remain virtually unchanged from last month. Deliveries by vendors continue to accelerate, while . . . employment and production percentages show but minor changes from previous months' levels."

According to the Cleveland association, "A tinge of pessimism is creeping into the thoughts for the immediate quarter, but pre-

dictions for the year as a whole continue to indicate a good 1960."

Its report states that lower prices are noted by P.A.'s who buy copper, copper products, and steel scrap. Most other industrial prices are steady, it says.

The North Jersey association says "There has been a substantial slowdown in the rate of boom, and replies tend to indicate that much less optimism prevails than was prevalent three months ago."

#### Production Rate Slows

It notes, too, that the "Price pattern continues upward, but at a reduced rate." And it states "The rate of increase in production has materially slowed."

The Georgia group reports "little change in business and business operations from last month." But its members anticipate improved conditions in the months to come.

# Production line economy plus first line quality...



## yours in the New 60-H silicon rectifier

The new Udylite 60-H rectifier has been designed to give you *all* the features you want in a low cost standard package. Production economies gained from strict standardization, and adherence to a specific range of sizes are being passed along to you.

There is no deviation from traditional Udylite quality. Finest construction and materials prevail throughout the 60-H series. These recti-

fiers have *all* the outstanding features of Udylite's Udysil rectifier series with individual diode and instantaneous DC overload protection.

A range of ten voltage/amperage combinations provides a unit of the right size and capacity to meet almost any normal requirement. If you're interested in quality *and* economy, investigate the Udylite 60-H today. See your Udylite man or write to:



on the west coast: the L. H. Butcher Company

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PURCHASING

## Pulse of Business

### Price Trends

- Demand Is Quiet in Nonferrous Markets
- Zinc Inventories Up, Shipments Decline

**T**HE NONFERROUS metal markets in recent weeks can best be described as quiet but steady. Purchasing agents have been meeting current production requirements, but they have been doing little buying to boost inventories.

This is the way the situation now stands in some of the major commodities bought by P.A.'s:

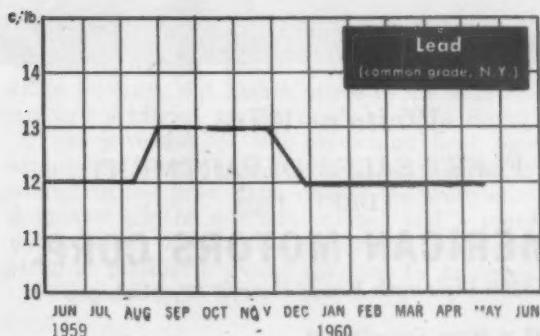
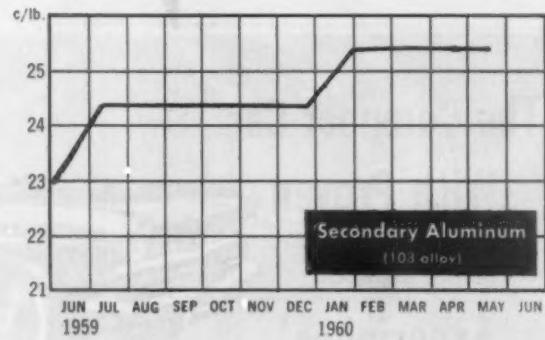
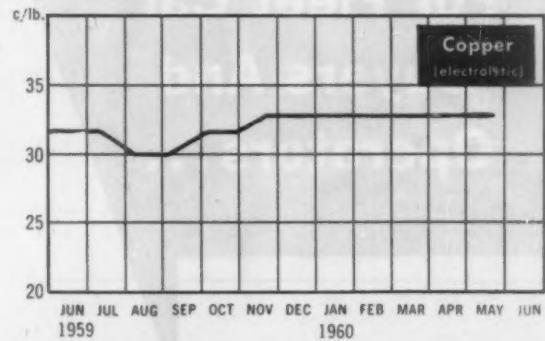
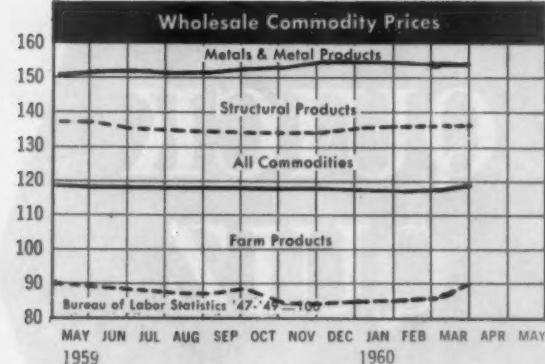
**Copper:** Following a spurt of copper buying in April, mostly by foreign companies, the pace has slackened somewhat. Nevertheless, Kennecott Copper Corp., one of the major producers, says its domestic output has been sold through this month.

In the latest monthly report of the Copper Institute, deliveries to fabricators rose 23,819 tons to 304,475 tons. In the same period, refined stocks were almost unchanged at 300,790 tons.

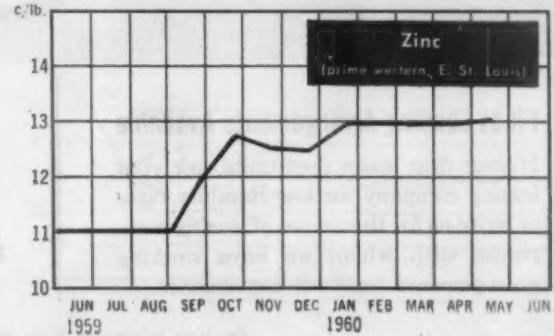
**Lead:** A few weeks ago, K. W. Green, purchasing director of Electric Storage Battery Co., predicted that lead might rise a half cent a pound to 12½ cents in the second quarter.

If demand continues in excess of production, higher prices are likely. Unsold stocks of refined lead fell 7121 tons to 109,148 tons—the lowest level since January 1958—according to the monthly report of the American Bureau of Metal Statistics. Domestic consumers took 44,076 tons, 6477 tons more than the previous month.

(Turn Page)



MAY 23, 1960



# A QUICK QUIZ

## For Fleet Car Buyers And Operators...

**Q.** *Are Rising Fleet Car Costs Ruining Your Budget?*

**A. Switch to Rambler!**

Rambler offers America's lowest-priced cars, based on manufacturers' suggested delivered prices.

**Q.** *Are Fleet Operating and Maintenance Costs Getting You Down?*

**A. Switch to Rambler!**

Fleet operators' own figures show Rambler averages approximately 4 more miles per gallon than larger fleet cars previously used. Maintenance costs of the quality-built Rambler also are substantially lower. In most states, insurance rates are less, too.

**Q.** *Are Bulky Fleet Cars Jamming Your Company Garage?*

**A. Switch to Rambler!**

The Compact Rambler—easiest to park and handle in traffic—takes up less garage space.

**The Compact Car  
With Proven  
FLEET  
Experience!**



### Fleet Leasing Arrangements Available

If your firm leases fleet units, ask your leasing company for low Rambler rates or write us for the names of leasing companies with whom we have working arrangements for your convenience.

*Write or Wire . . .*

**FLEET SALES DEPARTMENT  
DEPT. I-523**

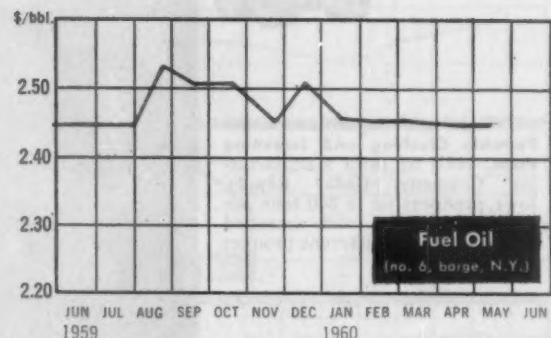
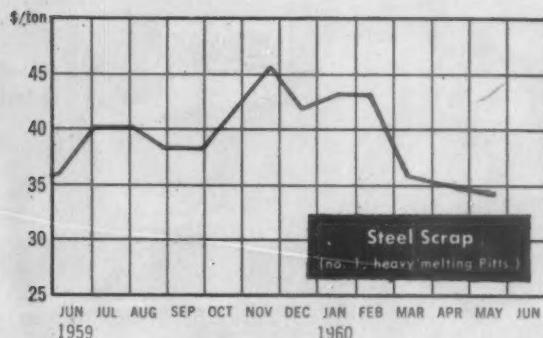
**AMERICAN MOTORS CORP.**

14250 Plymouth Road, Detroit 32, Michigan

For More Information Write No. 189 on Inquiry Card—Page 34

## Pulse of Business

### Price Trends



**Zinc:** While sellers are hoping for larger zinc purchases in the upcoming weeks, there has been no real indication of any upsurge recently. Demand for special high grade zinc by P.A.'s for die casters in the automobile industry remains slow.

In the April report of the American Zinc Institute, zinc inventories jumped 11,295 tons to 147,861 tons—the highest level since last December. Deliveries to consumers fell 16,509 tons to 64,251 tons.

**Tin:** A minimum amount of tin trading has been taking place in New York. However, no pressure has been noted on prices.

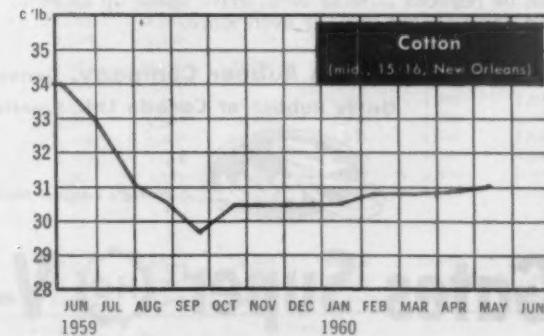
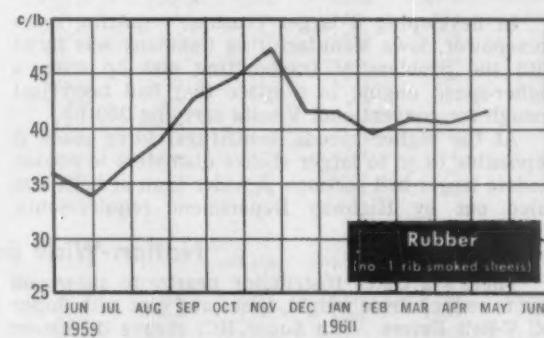
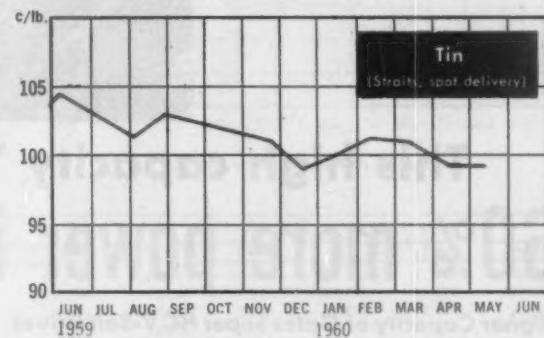
Total shipments from Malaya last month dropped 1962 tons to 4400 tons. In the first four months of 1960, though, shipments totaled 21,242 tons—up 7579 tons from the similar period last year.

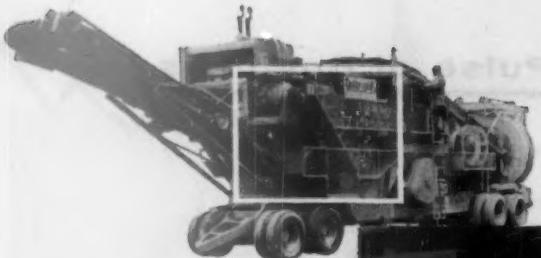
**Aluminum:** According to the latest monthly report by the Aluminum Association, primary aluminum production was 170,658 tons. This is a 13,832-ton increase in output over the previous month.

Production appears to be headed for a new high in 1960, topping last year's output of 1,953,019 tons. But shipments—while outstripping the 1959 mark—are not expected to be as high as was thought earlier this year.

**Rubber:** Rubber prices have been relatively stable recently. But higher prices in the near future are predicted by the Bank of Nova Scotia.

Primary reason for this prediction: total consumption of natural rubber was higher than world production last year. Thus, despite the probability of greater use of synthetic rubber and a more moderate rate of industrial expansion, prices may go up as producers' stocks continue to go down.





Cedarapids Super Commander  
Portable Crushing and Screening  
Plant, built by Iowa Manufacturing  
Company, Cedar Rapids,  
Iowa, produces up to 500 tons per  
hour of crushed and screened  
material in four different product  
sizes.



## This high capacity V-Belt Drive handles 60% more power in 30% less space!

**Higher Capacity of Gates Super HC V-Belt Drives  
solves complex product-development problem!**

In developing a larger crusher, requiring more horsepower, Iowa Manufacturing Company was faced with the problem of transmitting 400 hp from a higher-speed engine in a space that had been just enough for conventional V-belts carrying 250 hp.

At the higher speeds, centrifugal force made it impossible to go to larger sheave diameters to accommodate larger belt sections. A wider span of belts was ruled out by Highway Department requirements,

which restricted overall machine width to eight feet.

Iowa Manufacturing's designers solved their primary problem of transmitting 60% more horsepower with new Gates Super HC V-Belts.

Because Super HC V-Belts have smaller cross section, use narrower and lighter-weight sheaves, pack higher hp capacity in a smaller 'package' than conventional V-belts, designers also succeeded in reducing drive weight, width and height—a decided bonus in equipment that must be moved frequently both on and off the highway.

### Nation-Wide Engineering Service

There's a Gates Distributor nearby to show you how to reduce drive weight, space and cost with Super HC V-Belt Drives. With Super HC, sheave diameters can be reduced 30% to 50%, drive space up to 50%, and drive weight 20% or even more.

Ask your Gates Representative for your free copy of "The Modern Way to Design Multiple V-Belt Drives," or write to The Gates Rubber Company Sales Division, Inc., Denver, Colorado.

**The Gates Rubber Company, Denver, Colorado**

Gates Rubber of Canada Ltd., Brantford, Ontario

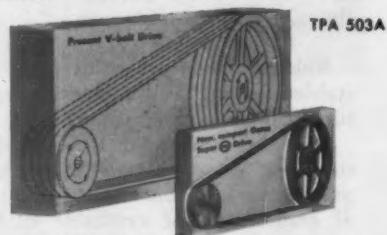


World's Largest Maker of V-Belts

# Gates Super V-Belt Drives

same hp capacity  
in smaller "package"

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## Pulse of Business

### Sales, Inventories, Orders

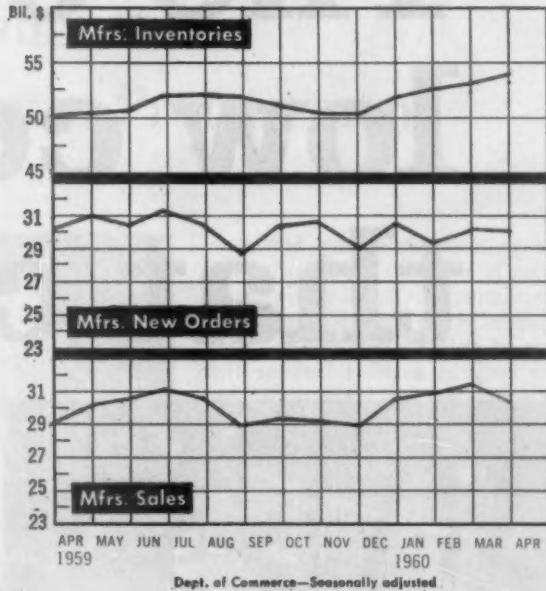
#### • Sales, Orders Decline; Inventory Rise Narrows

**M**ANUFACTURERS' sales and new orders declined in March, according to Department of Commerce reports. During the same period, however, inventories advanced.

Seasonally-adjusted sales dropped \$800 million from the previous month to \$30.8 billion. Much of the decline came in the steel industry.

New bookings fell \$500 million to \$30.1 billion. Although both durable and nondurable manufacturers felt the decline, new orders were higher in the fabricated metal and transportation equipment industries.

Inventories rose \$400 million to \$54.3 billion—equaling the previous record set in August 1957. But the rate of stock accumulation was lower than the three previous months, when gains of \$800 million, \$900 million, and \$600 million, respectively, were posted.



#### Manufacturers' Sales Seasonally Adjusted (Millions of Dollars)

##### All Manufacturing Industries

	1959	1960				
	Mar.	Nov.	Dec.	Jan.	Feb.	Mar.
Durable-goods industries	29,106	29,199	30,814	30,787	31,580	30,800
Primary metal	14,376	13,539	14,992	13,352	15,670	15,160
Fabricated metal	2,580	1,956	2,815	2,656	2,690	2,540
Machinery	1,605	1,637	1,751	1,690	1,780	1,690
Transportation equipment	4,926	4,750	4,699	4,695	4,840	4,760
Lumber and furniture	3,188	2,499	2,970	3,692	3,570	3,440
Stone, clay, and glass	918	930	906	843	920	890
Rubber	731	662	707	737	770	700
Nondurable-goods industries	14,730	15,660	15,892	15,435	15,900	15,650
Food and beverage	4,465	4,718	4,687	4,793	4,720	4,700
Tobacco	416	439	431	387	430	420
Textile	1,900	1,214	1,267	1,296	1,260	1,210
Paper	988	1,012	1,049	994	1,070	1,040
Chemical	1,979	2,248	2,371	2,268	2,380	2,300
Petroleum and coal	3,046	3,234	3,148	3,044	3,130	3,110
Rubber	506	476	508	506	570	530

#### Manufacturers' Inventories Seasonally Adjusted (Millions of Dollars)

##### All manufacturing industries

	1959	1960				
	Mar.	Nov.	Dec.	Jan.	Feb.	Mar.
Durable-goods industries	50,323	51,530	52,316	53,182	53,900	54,320
Primary metal	28,846	29,332	30,000	30,622	31,260	31,790
Fabricated metal	4,372	3,953	4,114	4,172	4,320	4,460
Machinery	3,120	2,890	3,105	3,091	3,230	3,340
Transportation equipment	9,155	9,693	9,848	10,174	10,320	10,440
Lumber and furniture	6,806	6,931	7,135	7,308	7,530	7,590
Stone, clay, and glass	1,722	1,864	1,854	1,886	1,870	1,860
Rubber	1,205	1,348	1,359	1,381	1,380	1,420
Non-durable goods industries	21,477	22,198	22,316	22,560	22,640	22,600
Food and beverage	4,752	4,791	4,775	4,796	4,820	4,850
Tobacco	1,876	1,972	1,972	1,975	1,950	1,950
Textile	2,451	2,500	2,490	2,554	2,650	2,640
Paper	1,462	1,405	1,500	1,541	1,540	1,540
Chemical	3,742	4,056	4,049	4,050	4,050	4,060
Petroleum and coal	3,286	3,275	3,306	3,405	3,400	3,340
Rubber	1,030	1,116	1,124	1,148	1,140	1,150

#### Manufacturers' New Orders Seasonally Adjusted (Millions of Dollars)

##### All manufacturing industries

	1959	1960				
	Mar.	Nov.	Dec.	Jan.	Feb.	Mar.
Durable-goods industries	30,214	29,549	30,890	29,698	30,590	30,120
Durable-goods industries	15,308	13,907	14,886	14,931	14,800	14,480
Nondurable-goods industries	14,906	15,642	16,004	15,467	15,790	15,650

(i) Revised.

(p) Preliminary.

seams to value

# The only low cost that counts



Washed coal stores better, handles better, and results in lower equipment maintenance costs.

You're not about to lose all interest in the invoice price of coal. But the closer you get to the coal picture in your plant, the more you realize that the important cost is the net cost per 1000 pounds of steam, and not the cost per million BTU. And it's when these final net costs are figured that the wisdom of choosing Island Creek Precisioneered Coals shows up. For

...when you buy coal...is low cost per 1000 pounds of steam. And that's why so many purchasing and plant men agree on Island Creek Precisioneered Coal.

these coals are from inherently superior seams, mined and prepared by the most modern methods to perform most efficiently in the specific burning equipment in which they will be used. Our engineers would like to lay some case histories before you and your plant people . . . and let you take it from there. Write or phone. No obligation.



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PURCHASING

# Joint Economic Committee Studies Defense Procurement

TESTIMONY on the impact of defense procurement on the economy—released recently by the Joint Economic Committee of Congress—made the point that with negotiated contracts, the government does not always have the assurance of fair and reasonable prices. Currently, as much as 80-90% of the value of all military purchases are made by negotiated contracts.

Comptroller General Joseph C. Campbell pointed out, however, that the complexity of modern-day equipment, devices, and systems used by the military makes it hard to get effective competition or to forecast costs with reasonable accuracy.

The Comptroller General said that his office has disclosed many instances where the government paid excessive prices for goods and services because government buyers failed to obtain and evaluate the latest available cost data.

### Cites Cases

As an example of the shortcomings in government purchasing, Comptroller Campbell cited a case where the contractor's cost estimate submitted in support of his price proposal included estimates of subcontracted work at prices paid previously. These prices, however, were higher than the maximum prices established between the prime and the sub prior to the negotiation of the follow-on contract.

The government contracting officer did not have information about the lower subcontract prices in effect at the time of the negotiations. As a result, the military was overcharged \$1.5 million.



Comptroller General Joseph C. Campbell told the Joint Economic Committee that 80%-90% of all military buying is done by negotiated contracts.

In other cases, government buyers began negotiations before contractors had sufficient production experience to develop costs upon which to base reasonable prices.

While Congress and the Comptroller General's office have indicated for many years that they are unhappy about the military procedure of buying by negotiation, the problem is apparently still no nearer solution.

The ASPR (Armed Services Procurement Regulation) was revised early last year to tighten up on military buying practices. But what is needed, said Mr. Campbell, is "follow-up action."

Comptroller Campbell testified:

"The actions taken by the Department of Defense to improve procurement procedures and practices are commendable. We believe, however, that the problem of achieving efficient and economical procurement requires an in-

tense and continuing training effort to improve the skills of contract administrative personnel. There is also an ever-pressing need for follow-up action to see that revised policies adopted by the Department of Defense are being followed and that full cooperation is extended by the contractors."

### • Import Threat Cited Before House Comm.

While the government is beating the drums to stimulate exports of U. S. goods, government and industry leaders are showing increasing alarm over competition from foreign products.

Chief spokesmen on behalf of increased exports are Secretary of Commerce Frederick H. Mueller and Undersecretary Philip A. Ray. Both stress that sales abroad strengthen private business and make jobs in this country. The jobs of 4½ million U.S. workers depend on world trade, they say.

### Stimulating the Drive

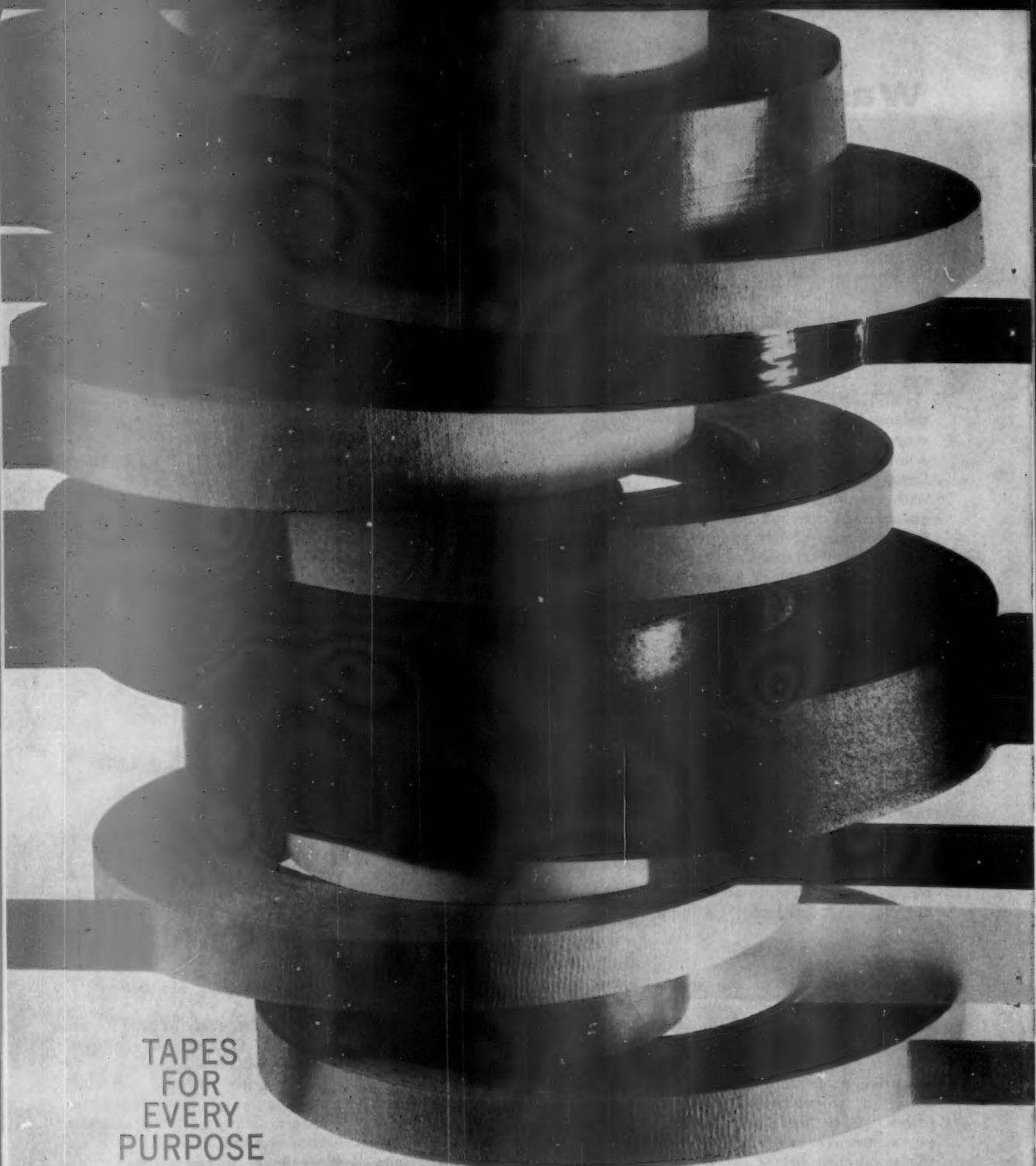
Stimulating this drive to increase our sales abroad are these five factors:

(1) We are meeting increased trade competition from Japan and Western Europe in the markets where we sell, and therefore we have to step up our efforts or lose ground.

(2) General prosperity abroad has increased demand, and there has been a relaxation of discriminatory restrictions against us.

(3) There is the prospect of another large balance-of-payments deficit.

(4) Greater interest is being



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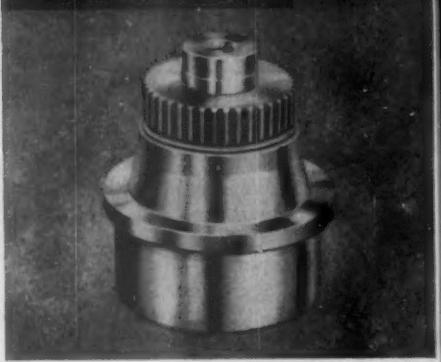


**UNBRAKO**

**INDUSTRIAL FASTENERS** like this Socket Head Cap Screw are produced to a dynamic reliability standard as a result of SPS research. The SPS line includes a limitless variety of self-locking screws, locknuts and precision fasteners for everything from massive machinery to the most minute products.

**SPS AIRCRAFT**

**AIRCRAFT/MISSILE FASTENERS** like this bolt are produced to ultra-high performance standards at SPS. Today's lightest, strongest fasteners in standard and special designs are products of SPS. Research and development work includes titanium, beryllium and other lightweight, high-strength exotic metals.

**SPS NUCLEAR**

**NUCLEAR COMPONENTS** like this cap for a core housing are held to almost unbelievable dimensional tolerances. The nuclear energy field depends on SPS for threaded fasteners, control rod drive mechanisms, motor tubes, core components, instrumentation housings and many other essential parts.

## SPS research doubles



Oscilloscope registers load applied to UNBRAKO Socket Cap Screw during fatigue test. Results prove new Hi-Life thread and pHd head design have doubled fatigue life of UNBRAKO Socket Screws.

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**SHOP EQUIPMENT** for industry and schools is made to the same superior quality standards as other SPS products. The Hallowell line offers broad coverage of standard and special needs in work benches, shelving, and similar equipment. Ruggedness and space efficiency are well identified with Hallowell.

**OFFICE FURNITURE** like this handsome Columbia Nine-to-Five unit sets an office apart with distinctive styling and color combinations. The complete line includes efficiently designed, durable steel office furniture, plus special units, a wide choice of smart chairs, filing cabinets and accessories.

**CAPACITORS FOR ELECTRONICS** bearing the IEI trademark are widely used for subminiature circuitry and transistorized applications. This SPS company makes both aluminum and tantalum capacitors, including the lightest and smallest per given capacitance in the industry, to the highest quality standards.

## "breathing" life of socket screws

A fastener is almost constantly in motion. Sometimes minutely . . . but often stretching and flexing violently under varying stress loads.

This "breathing" . . . you probably know it better as fatigue, is the killer that tires the metal in a fastener until it breaks. The period from installation to fatigue failure is fatigue life.

Two major developments in the SPS laboratory for advanced fastener research have now doubled fatigue life of UNBRAKO Socket Head Cap Screws.

First is in the thread . . . where 85% of all screw failures occur. Research proved the flat root in an ordinary thread form invited fatigue cracks at its

sharp corners. SPS eliminated this danger with the smooth, wide root radius now exclusively on UNBRAKO Hi-Life Socket Screws.

Second is in the head . . . where research has added 233% more load-carrying capacity. Proper head design ( $pHd$ ) in the 1960 series incorporates a larger head for more bearing area . . . a more generous head-to-shank fillet . . . and an enlarged socket area for better wrenching and higher tightening torques.

Together these advanced developments add up to the highest reliability you can get in any socket screw today. Write for literature.



UNITED STATES



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where reliability replaces probability



GREAT BRITAIN



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maintain precision  
tolerances on  
Ford Falcon engines**



At Ford Motor Company's Lima, Ohio, plant you'll find the newest techniques and finest equipment being used to produce the six-cylinder, high efficiency, overhead valve engine developed specifically for the new Falcon. And, coincidentally, you'll find many of the machine tool builders have equipped their modern machines with Vickers hydraulics.

Modern production equipment and Vickers hydraulics just go together naturally. Machine builders and users know these pumps, motors and control elements can't be beat in design features and quality of manufacture.

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**Machine tool builders using Vickers components  
at the Falcon engine plant**

Apex Corporation	Lundis Tool Company
Bilt-Rite Tool Co.	LaSalle Machine Tool, Inc.
Bahr Machine Tool Co.	The R. E. LeBlond Mach. Tool Co.
Cen-Tec Division	Leland Detroit Mfg. Co.
Centri-Spray Corp.	Micromatic Noise Corporation
Colonial Broach & Machine Co.	Morris Machine Tool Co.
The Cross Co.	The Match & Merryweather Machine Co.
Ex-Cell-O Corporation	Sayler Corp.
Greenlee Bros. & Co.	Sundstrand Machine Tool Division of Sundstrand Corp.
Holcroft & Company	Surface Combustion Division of Midland-Ross Corp.
Industrial Metal Products Corp.	Tocco Division The Ohio Crankshaft Co.
The Ingersoll Milling Mach. Co.	Turner Brothers
Kent-Owens Machine Company	Wilson Automation Co.
N. R. Kroeger & Co.	
F. Jos. Lamb Co.	

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# Purchasing Follow-up

## Industrial Lighting Can Now Be Leased

A nationwide leasing plan has been set up whereby modern fluorescent lighting can be installed in old or new buildings on a five-year rental.

Purchasing agents who desire to lease lighting can sign a contract directly with Smithcraft Corporation which is operating the plan in conjunction with General Electric Credit Corporation. P.A.'s can choose their own electrical contractor, and payments are made directly to the GE subsidiary.

Industrial lighting is available for as little as  $\frac{3}{4}$  cent per square foot per month. This system preserves liquid working capital, normal borrowing capacity remains undisturbed, and installation costs can be included in the lease package.

## Aluminum Problems Aired by Subcommittee

A stormy series of hearings on developments in the aluminum industry were held recently by the Yates subcommittee of the House Small Business Committee.

The subcommittee, headed by Representative Sidney R. Yates (D-Ill.), heard speakers from all segments of the industry discuss current problems. Among the topics discussed were "hot metal" contracts, possible price squeezes, and the rising exports of aluminum scrap.

Richard E. Kellers, associate secretary of the American Die Casting Institute, charged that the primary aluminum producers had set up a "complex" pricing formula for "hot metal." Captive foundries of automobile manufacturers, he said, receive primary aluminum at about  $2\frac{1}{2}$ ¢ lb. below list price for metal in pig form—while actual pigging costs are no more than 0.5¢ lb. He declared that because of this differential, custom die casters are

losing markets to the captive foundries.

Speaking for the Aluminum Smelters Research Institute, Secretary Carl R. Burton emphasized that his group was not opposed to "hot metal" deals as such. But he did attack aspects of the so-called discriminatory pricing formula.

Mr. Burton also said that while there is presently enough aluminum scrap, the supply may get tighter later this year and in 1961. He pointed out that scrap exports this year could be almost double those of 1959 if the current rate continues.

### Deny a Squeeze

However, representatives of the primary aluminum and automobile industries denied that there was any attempt to squeeze prices or throttle competition. They also denied that molten metal contracts have had any adverse effect on small business.

Spokesmen for Reynolds Metals Co., Aluminum Company of America, Kaiser Aluminum &

Chemical Corp., Ford Motor Co., Chrysler Corp., and General Motors denied that they were responsible for the problems of the extruders. As proof, they cited the increased number of independent extruders going into business in recent years.

## Govt. Boosts Status of Contract Administration

Military contract administration is a top management function, students at the School of Logistics, Wright-Patterson Air Force Base, were told recently.

Top ranking officers from the three military services emphasized the importance of finding and keeping good suppliers. And E. G. Bellows, chairman-elect of the National Security Industrial Association, told the Army, Navy, and Air Force representatives that vendors must "do the job according to specifications, meeting the deadline, and at the lowest possible cost."

Major General W. K. Ghormley, Commanding General of the Army Ordnance Special Weapons-Ammunition Command, said that "We must encourage understanding between ourselves and industry. In differences of opinion, which exist anywhere, we strive to reach an objective compromise, with each side giving to the common defense effort."

### Deserves Respect

The Chief of the Bureau of Naval Weapons, Admiral F. F. Metzger, noted "We must not waste money on unnecessary changes. Contract administration is a professional job and deserves the respect of the military-industry top management."

And Major General W. T. Thurman, on the staff of the Deputy Chief of Staff for Materiel of the Air Force, said "Many times we offer to the contractor performance specifications without knowing what the end-item will look like. To insure a



Richard E. Kellers, associate secretary of the American Die Casting Institute, told a House Small Business subcommittee that there was unfair price discrimination in "hot metal" aluminum contracts.

**Quality control at Standard** is second to none among the nation's major specialty product steel plants. It is maintained by the most accurate, up-to-date testing equipment available. The laboratory facilities operate around the clock to keep all vital information flowing to our metallurgists, shop foremen, mill and machine

operators—as well as to plant management, and, of course, our customers.

Bring your next unusual product to us—we'll welcome the opportunity to serve you regardless of the alloy it might require. Send for the free illustrated booklet, "Quality Control at Standard."

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Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes



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# Purchasing Follow-up

quality, worthwhile end-product, we must work closely with industry to assure skills, resources, knowledge, and mutual teamwork—allowing industry the right to free enterprise and allowing to ourselves the proper guidance when needed."

## 20% of Business Form Spending Is Wasted

American companies are wasting 20% of their annual printed business form expenditures because of poor paperwork control, Tom S. Bowman of Cullom & Ghertner Company, Nashville, Tenn., printing firm, told an American Management Association Seminar in New York recently.

"This money is going down the drain in a flood of paper," Mr. Bowman charged. He added that "the saddest thing about this is that all of these companies have within their grasp the means for considerably cutting down on this waste and putting the resulting savings to better use."

Mr. Bowman singled out "proper forms management control systems as the key to reducing the 20% waste." He noted that "a well organized forms management program in any company will result not only in less paperwork, but from the overall management point of view, it will also bring about better communications and general management operation throughout the organization."

The printing executive also revealed that one of the major reasons for high paperwork costs lay in the fact that management has little concept of the cost of a printed business form such as a memo or invoice.

"Such forms, if improperly ordered, designed and used, can cost up to \$20 each," he reported. Mr. Bowman said that "this cost can be reduced if management would stop thinking of a form only as a little piece of paper,

and started realizing that forms are expensive and should be carefully thought out before they are put into company use."

## Booklet Describes 'Productive Purchasing'

A booklet that provides a detailed approach to appraising product value in industrial purchasing has been published by General Electric Company.

The publication, titled "Productive Purchasing," describes ways to improve purchasing methods by a more scientific application of analysis techniques. The productive purchasing concept, according to the booklet, includes not only value analysis and pre-production purchase analysis, but also comparing the capabilities and services of competing suppliers.

## Evaluating Suppliers

A scaled checklist for evaluating equipment suppliers is included. It can be used for appraising added values, such as reliability, technical capabilities, after-sale service, availability, buying convenience, and sales assistance.

Two suggestions are made for organizing a purchasing department. They are:

(1) Integrate the purchasing effort with other business functions. A panel of representatives from engineering, marketing, finance, and manufacturing can provide a two-way channel of advice and information to assist the purchasing department make its evaluations.

(2) Streamline purchasing procedures. Use of automation and electronic machines can eliminate much time consuming work—thereby leaving more time for decision-making.

Several case histories illustrate results from typical applications of productive purchasing. The booklet is available from GE, Schenectady 5, N.Y.

**"Our instrument engineers rely on these GC charts"**



*"Charts when they want them and charts that are best—that's what our instrument engineers know they can get from me, now that I've discovered GC Recording Charts and GC service!"*

Instrument engineers in more than 5,000 plants rely on GC Recording Charts for the same two reasons:

**1. THEY ARE GOOD!** Every GC Recording Chart will give an accurate, precise, legible and lasting record of an instrument's operation—the result of more than 50 years of specialization in chart printing. Special GC chart papers, new ink formulas, exclusive plate-making techniques—all work together to produce top chart performance.

**2. THEY ARE THERE!** GC stocks more than eight million charts, ready for off-the-shelf delivery. Special orders get special attention. (With the GC Periodic Shipment Plan, charts are shipped *before* you need them—automatically.)

Tell us the maker and number of any key instrument in your plant. We'll send sample charts. Let the engineers judge the performance. You judge the service, and the price!



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189 Van Rensselaer St., Buffalo 10, N.Y.

A SUBSIDIARY OF:

**GRAPHIC CONTROLS CORPORATION**

Buffalo 10, New York

For More Information Write No. 197  
on Inquiry Card—Page 34

*After 31 years of continuous growth and  
We're changing*

# The Bendix

To reflect our dynamic growth in such fields as electronics, missiles and space, automotive, weapons systems, computers, machine tools, instrumentation, nuclear technology, hydraulics, meteorology, electrical, marine and others, we are dropping "Aviation" from our corporate name on June 1, 1960. We do not wish to convey the impression that our products and skills are limited to the field of aviation alone, although aviation products accounted for billings of \$388,700,000 in 1959.

Today Bendix—through 25 divisions and 16 subsidiary and affiliate companies around the world—serves many fields.

Our success in the rapidly expanding age of aviation has long obscured the fact that the Bendix® automobile starter drive was the company's first major product. Bendix introduced the type of four-wheel brakes that over the years has been used on most makes of cars. Bendix also pioneered automotive power brakes and power steering. Our automotive business in 1959 totaled \$114,300,000.

A notable trend in Bendix' recent history is the utilization of electronics in many of our major fields of activity. These range from automobile radios to

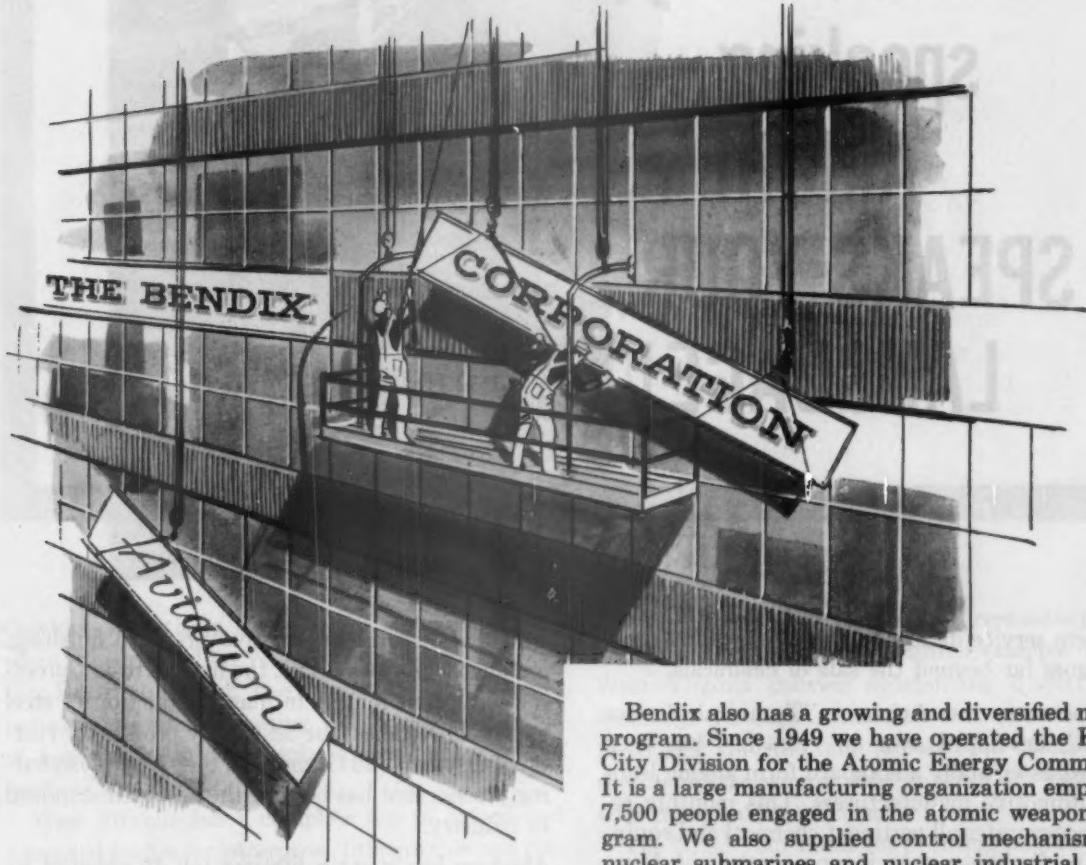
aircraft and industrial communications and automatic flight controls . . . from electronic computers and data processing to numerical tape control systems for machine tools . . . and from transistors and ship-to-shore telephones to sonic cleaning and undersea sonar detection equipment. Approximately 40% of Bendix products are electronic, including air defense radar which today guards 25 million square miles of the earth's surface.

Missile and space equipment accounted for \$103,000,000 of our total business of \$689,692,312 in 1959. In addition to being the prime contractor for two important missiles, Talos and Eagle, we are also a supplier of components and sub-systems

*diversification as Bendix Aviation Corporation . . .*

*our name to*

# Corporation



for most U. S. missiles. Bendix is likewise taking an active part in Project Mercury and in satellite communications. The first is the program to put a man into space. The second will mark a new era in communications by using a satellite in orbit as a relay station for global radio messages between earth stations and aircraft.

Bendix also has a growing and diversified nuclear program. Since 1949 we have operated the Kansas City Division for the Atomic Energy Commission. It is a large manufacturing organization employing 7,500 people engaged in the atomic weapons program. We also supplied control mechanisms for nuclear submarines and nuclear industrial power plants, and we are playing a part in developing the newest U. S. atomic power plants for aircraft, missiles and space vehicles.

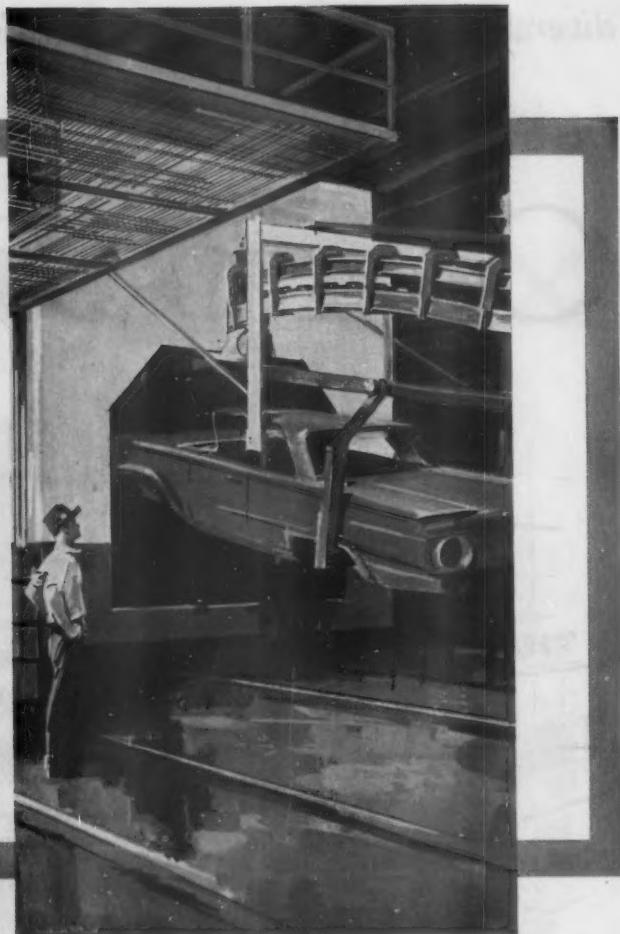
Thus, as we drop "Aviation" from our corporate name, but not from our programs, we face a tomorrow where the range of our opportunities is broadening at a breathtaking rate.



*A thousand diversified products*

For More Information Write No. 198 on Inquiry Card—Page 34

# Automotively speaking... **AMCHEM** **SPEAKS YOUR** **LANGUAGE!**



Amchem service in automotive phosphating processes goes far beyond the sale of chemicals.

For instance, the Amchem "Technical Service Report" developed over 13 years ago has been adopted as virtually a standard form among leading automotive manufacturers. This monthly report incorporates all pertinent chemical and equipment performance data in one convenient form, has manifold advantages in keeping local and district management informed of line conditions for chemical control and maintenance, produces higher levels of quality through extra vigilance in controlling chemical baths and equipment.

In the past Amchem service has achieved signifi-

cant advances in automotive prepaint finishing, among them—Deoxidine, the first corrosion-proofing treatment for use in mass production of steel automobile bodies; the first spray process for rust-proofing steel; and Granodine, the spray phosphating process that has become the accepted standard in industry.

Amchem has spent a lifetime (all 46 years of its corporate existence) providing phosphating services to the automotive field. If your requirements embrace more than phosphating chemicals alone, look to Amchem's Metal Protection Laboratories where, automotively speaking, we speak your language!



## AMCHEM PRODUCTS, INC.

(formerly American Chemical Paint Co.)  
AMBLER, PA.

Detroit, Mich., St. Joseph, Mo., Niles, Calif., Windsor, Ont.

Amchem, Granodine and Deoxidine are registered trademarks of Amchem Products, Inc.

For More Information Write No. 199 on Inquiry Card—Page 34



better way  
to tell  
the world

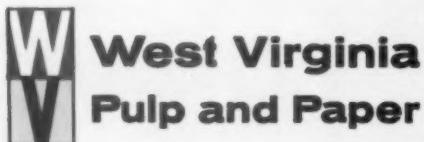
Outdoor advertising looks better and sells harder when lithographed on West Virginia's exclusive Vac Cup Bac Poster paper. The unique glue-trap backing permits more positive posting. This is another example of how West Virginia engineers its papers to the needs of the job.

West Virginia has a complete line of coated and uncoated grades for letterpress, lithographic and gravure printing. All grades are made to rigid specifications for better performance. Furthermore, many additional benefits in service and overall value are

yours because of West Virginia's direct sales policy.

Fine printing papers are another example of how West Virginia delivers outstanding quality with economy. Through a research investment of over \$3,000,000 annually, and almost total utilization of raw materials, we are able to serve our customers with moneysaving efficiency.

The larger your needs for printing, publication or converting papers, the more it will benefit you to contact: Fine Papers Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N.Y.



For More Information Write No. 200 on Inquiry Card—Page 34

MAY 23, 1960

# Woman's angle on an extra sales point... the luxury and practicality in fabrics containing DuPont Upholstery Nylon

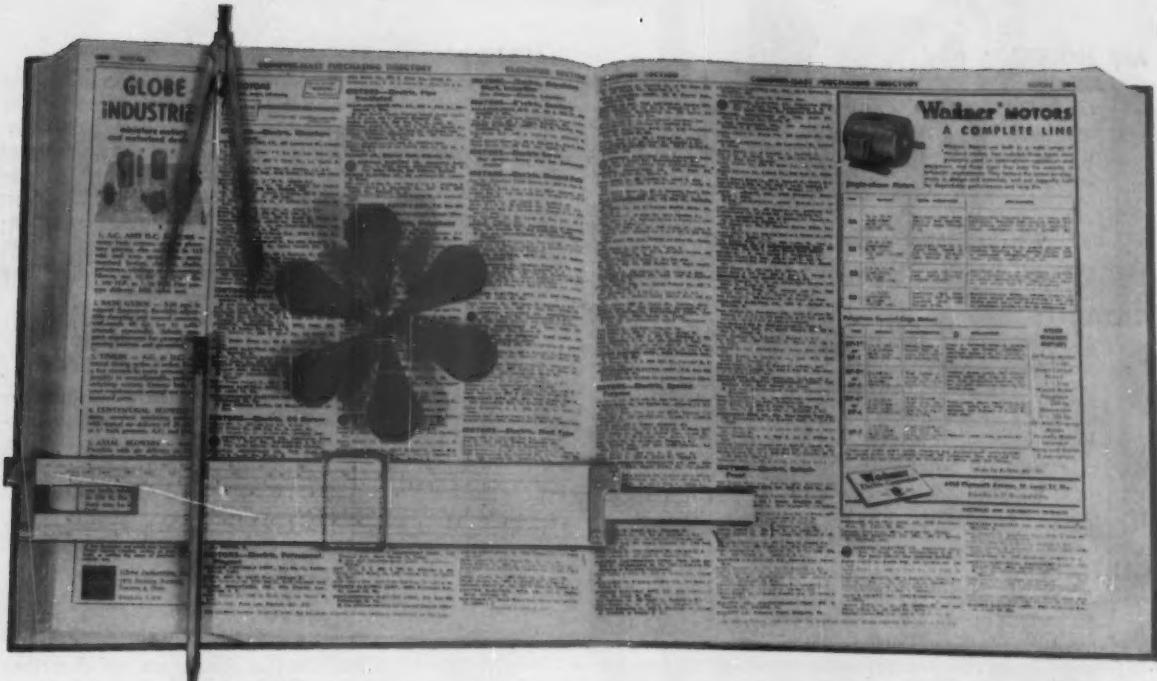
While he's looking over the motor, she's doing some serious looking on her own—for style and value. That's why you're wise to play up the fabric when it contains Du Pont Upholstery Nylon. She knows nylon upholstery in her home. She's already sold on its performance, its beauty, its year-round comfort. Get her thinking about the fashion and quality of Du Pont Upholstery Nylon, and you're off to a better selling start. Before he gives you the nod for this Park Lane Mercury, for instance . . . he looks for her nod first!



BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY



For More Information Write No. 201 on Inquiry Card—Page 34



## \*Value Analysis Starts Here

Good suppliers are the foundation of any value analysis program. CONOVER-MAST PURCHASING DIRECTORY gives you a reliable list of manufacturers of industrial products. It gives you:

- the company name,
- address,
- telephone number,
- size of company,
- and necessary technical data.

*Next time you use a directory, use CMPD.*



### Conover-Mast Purchasing Directory

205 E. 42nd St. New York 17, N.Y.  
MU 9-3250

# Information For Your Catalog Files

## AIR HOISTS

Service Manual No. 10756 describes lightweight air hoists. The 12-page booklet includes complete operating, maintenance, and inspection instructions. Has parts lists and tool diagrams for four 500-pound capacity hoists.

**Thor Power Tool Company**

Write No. 202 on Inquiry Card—Page 34

## CAPACITORS

Booklet B-7642 describes how industrial capacitors reduce power costs and increase system capacity. The 12-page brochure covers a discussion of power factors, benefits, selection, and applications.

**Westinghouse Electric Corporation**

Write No. 203 on Inquiry Card—Page 34

## CLUTCHES

A catalog describing four basic series of general-purpose clutches for indexing, backstopping, and over-running applications. Covers a range of sizes and torque capacities from 50 lbs in. to 136,500 lbs ft. Size ranges are from .250 in. to 12,000 in. bore diameters.

**Formsprag Co.**

Write No. 204 on Inquiry Card—Page 34

## COILS

Bulletin B-1518 illustrates and describes a line of heavy duty coils for steam, steam distribution, and hot water. Discusses materials and construction details. Also includes layout drawings and tabulated data on dimensions and weights.

**American-Standard**

Write No. 205 on Inquiry Card—Page 34

## INDUSTRIAL TRUCKS

A six-page illustrated folder on industrial trucks for die handling. Contains full specifications of vehicles with capacities from 6000 lbs to 120,000 lbs. Height, weight, and turning space are charted. Shows the four basic types: push-pull, side and end-loading, winch, and "fifth wheel."

**Eiwell-Parker Electric Company**

Write No. 206 on Inquiry Card—Page 34

## MATERIALS HANDLING

A catalog describing a variety of plant and warehouse materials handling equipment. Includes stacking storage bins, automatic dump boxes, and automatic side dump trailer trucks.

**Palmer-Shile Company**

Write No. 207 on Inquiry Card—Page 34

## MOTORS

Bulletin No. GEC-1049 is a selection and buying guide for single and three phase motors from  $\frac{1}{4}$  to 150 horsepower. The 14-page, two-color illustrated booklet has an application chart of types recommended for various loads and ambient conditions. Includes dimensions, prices, performance data, ordering instructions, modifications, accessories, typical ratings, and construction features.

**General Electric Company**

Write No. 208 on Inquiry Card—Page 34

## PACKINGS

A catalog covering molded packings. Illustrates each type and lists descriptions of particular construction and specific use. Includes style numbers, compositions, temperature ranges, services, and prices. Has tables on OD's, ID's, heights, wall thicknesses, and groove lengths.

**Greene, Tweed & Co.**

Write No. 209 on Inquiry Card—Page 34

## PUMPS

A four-page bulletin that illustrates and describes centrifugal and turbine pumps. Includes features, typical applications, and head ranges. Covers pumps with capacities from 1 to 9000 g.p.m.

**New York Air Brake Company**

Write No. 210 on Inquiry Card—Page 34

## RECORDERS

Catalog 800 describes temperature and pressure recorders. The eight-page bulletin pictures spiral bourdon tube and bellows type pressure elements, and lists materials and performance characteristics. Also includes diagrams showing case dimensions.

**American Machine and Metals, Inc.**

Write No. 211 on Inquiry Card—Page 34

## STAINLESS STEEL

Adv. 1124 is a booklet on chromium-nickel types of stainless steel. Contains general information and technical data for making design and buying decisions.

**Republic Steel Corporation**

Write No. 212 on Inquiry Card—Page 34

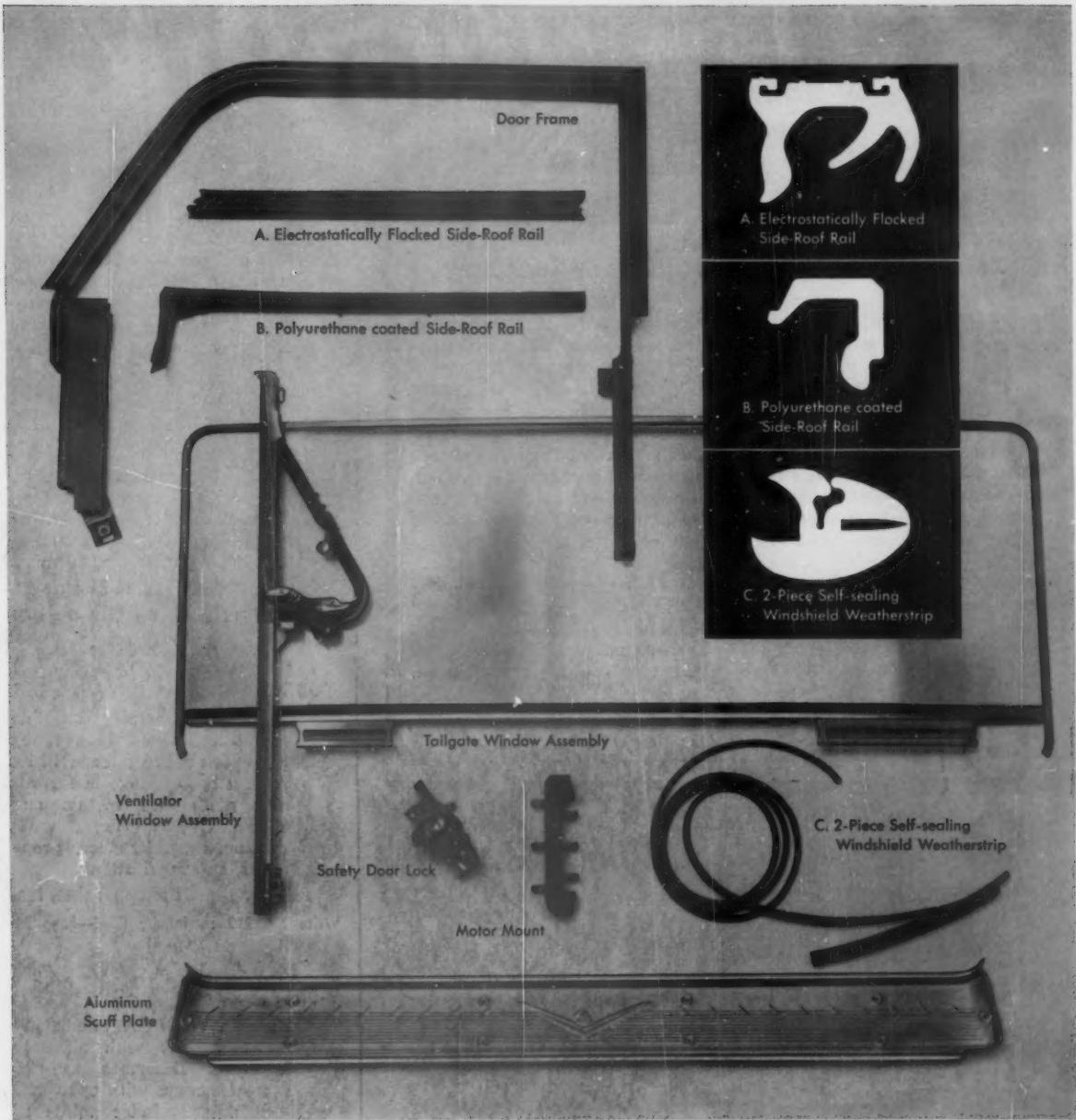
## STRAINERS

An 88-page handbook for simplified selection of industrial strainers. Contains reference data on fold-out pages for the layout of fluid flow systems, tabulated results of testings, and valve and pipe information. Has over 100 illustrations of pressure drop, temperature, and viscosity charts.

**Tate Engineering, Inc.**

Write No. 213 on Inquiry Card—Page 34

**PURCHASING**



## Each year, more Standard Products parts go into American cars and trucks

The wide variety of products above, all have one important feature in common: They were all engineered by Standard Products in cooperation with our automotive industry customers, and they are all easily within the scope of our highly versatile manufacturing facilities.

Fact is, these are just a few of the many products engineered and produced by Standard Products, and the variety of future products is literally unlimited. The broad range of

materials we work with includes rubber, fabric, steel and non-ferrous metals. Skills that we have at your service include precision stamping, plating, rubber extruding and molding, flocking, and mass production assembly of complex products...all processes carried out with highly automated facilities.

We are equipped to handle almost any job required of an automotive supplier, working with you from the plans on your drawing board, through to the final assembly line integration of our components with your product.

Our reputation for top quality and prompt delivery is well

established, and we work constantly to protect that reputation.

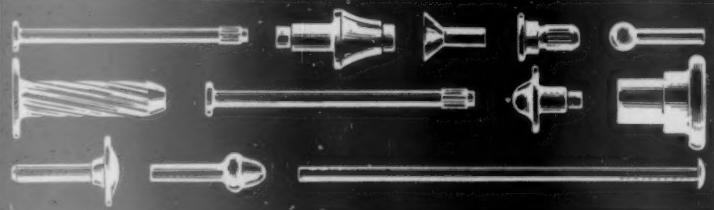
Let us put our specialized skills to work for you in the development and low-cost production of new assemblies for future models—up to five years ahead. In Detroit call TRinity 1-7502.



*The Standard Products Company*

GENERAL OFFICES: 2130 WEST 110 STREET, CLEVELAND 2, OHIO  
SALES OFFICE: 316 FISHER BUILDING, DETROIT 2, MICHIGAN

For More Information Write No. 214 on Inquiry Card—Page 34



## Job-Designed Rivets for Every Industry



Here is a fast, dependable, low cost, quality minded source of supply for JOB-DESIGNED fasteners of all types, in any metal, to fit your own assembly problem. Assembly costs are a very major part of manufacturing expense. Most of this is labor. The fastening medium itself is usually a minimum item. If a Job-Designed fastener makes assembly simpler and faster, permits the use of fewer fasteners, allows the designer functional freedom and improves product efficiency, yours is a specifying job well done. All these

possibilities are available when you come to Hassall for design assistance and quotation on challenging, difficult or unusual rivets, threaded nails, drive screws and other cold headed parts. Short or long runs, pilot quantities, engineering counsel, over 100 years of intimate association with cold heading—and a deep appreciation for the concept of value analysis—all are part of the Hassall service to you.

Send for a copy of our latest catalog.

**JOHN HASSALL, INC.**  
MANUFACTURERS SINCE 1850  
P. O. Box 2268 • Westbury, Long Island, N.Y.

For More Information Write No. 215 on Inquiry Card—Page 34

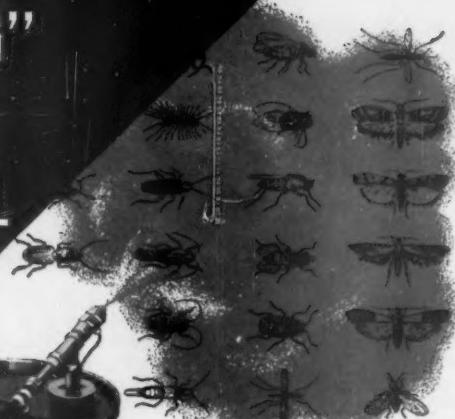


SEE a demonstration by a specialist

SIMPLIFIED

# "DRY FOG" INSECT CONTROL

PROGRAM



for FREE demonstration or literature address:  
**WEST CHEMICAL PRODUCTS INC.**, 42-24 West St., Long Island City 1, N.Y.  
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

For More Information Write No. 216 on Inquiry Card—Page 34



## Catalog Files

### SWITCHES

Bulletin EC-SL260 describes snap-lock limit switches. The 16-page illustrated bulletin covers key design features, specifications, parts lists, actuating cams, and operating levers. Also includes ordering information.

**National Acme Company**

Write No. 217 on Inquiry Card—Page 34

### TRANSFORMERS

A four-page brochure on a wide variety of transformers. Cover applications ranging from 10 kva to 10,000 kva. Includes sub-station, distribution, and power transformers.

**Federal Pacific Electric Co.**

Write No. 218 on Inquiry Card—Page 34

### TUBING

A 12-page catalog on fine seamless tubing. Describes manufacturing capabilities from a broad range of ferrous and nonferrous metals and alloys. Covers sizes, wall thicknesses, tolerances, properties, and applications.

**Uniform Tubes, Inc.**

Write No. 219 on Inquiry Card—Page 34

### V-BELTS

Bulletin V-227 covers custom-made V-belts with alligator fasteners. Describes use of these fasteners with open-end V-beltting. Includes points to remember for design of new drives.

**Flexible Steel Lacing Co.**

Write No. 220 on Inquiry Card—Page 34

### VOLTAGE REGULATORS

Bulletin 3300 describes tubeless magnetic-amplifier voltage regulators for a-c generators or generator excitors. The 14-page letterhead-size catalog includes a detailed description of operation with schematic wiring, connection, and dimension diagrams.

**Fidelity Instrument Corp.**

Write No. 221 on Inquiry Card—Page 34

PURCHASING

## Purchasing Profiles



M. C. CASE, Division Purchasing Agent, Rohm & Haas Co., Philadelphia, Penna., says:

### "The Yellow Pages are our best up-to-date guide to specialized local services."

"Nothing's more annoying than trying to reach a local supplier who's no longer located where you think he is. Thanks to the Yellow Pages, our office is able to keep up-to-date on who's where. With current Yellow Pages directories for all our plant areas—Philadelphia, Houston, Knoxville—we can easily locate sources of specialized equipment and services fast—right in the areas where they're needed."

Save time! Save temper, too! Keep and use an up-to-date library of Yellow Pages directories covering all of the localities where you make purchases. There's nothing like the Yellow Pages for helping you find specialized, unusual, hard-to-find equipment and services *fast!*

America's Buying Guide for over 60 years!



For More Information Write No. 222 on Inquiry Card—Page 34



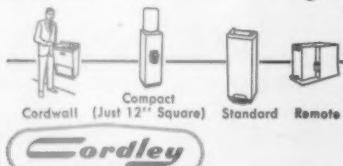
**your  
best buy  
from any angle  
...CORDLEY**

One big reason for this is that every hermetically-sealed Cordley Cooler carries the most extensive 5-year guaranty in the industry. Another is the fact that there's a Cordley Water Cooler for every conceivable drinking water need.

No matter how you look at it, the best criterion by which to judge a water cooler is the manufacturer's *long-term reputation* for service and satisfaction. Cordley has been the first name in water cooling since 1889...as proved by the fact that more than a million Cordley Coolers have been sold during that time.

Whether it be the new Cordwall (wall hung type), a remote or a standard cooler, your local Cordley representative will be happy to help you select precisely the right cooler for your application from the complete Cordley line. Just drop us a line and we'll send you his name. He'll show you why your best buy from any angle is Cordley.

© 1957



**CORDLEY & HAYES**  
443 Park Avenue South, New York 16, N.Y.

For More Information Write No. 223  
on Inquiry Card—Page 34

## Letters To The Editor

### FROM OUR FILES

Dear Sir:

In reading past issues of your magazine I recall examples on rating of vendors according to quality and delivery. Also, I recall seeing a sample form which would be used as a vendor survey sheet or technical information involved in establishing relations with a new vendor.

I have rechecked the issues but am unable to locate this information and would appreciate your assistance.

James W. Clayton  
Stratoflex, Inc.  
Fort Worth 14, Texas

- We're pleased to be able to loan our editorial file on this subject to Mr. Clayton.

### POINT OF PURCHASE

Dear Sir:

I would like to see your very fine magazine review the purchasing department's participation in the procurement of advertising display material which is often handled by advertising and sales promotion departments.

A comprehensive exploration of this subject in your magazine would be most welcome.

William H. Bunin,  
Director of Purchases  
The Toni Company  
St. Paul 1, Minn.

### COAST TO COAST FREIGHT

Dear Sir:

In Leonard Sloane's article "Traffic Tips For The Small Company P.A." (March 14 issue), he pointed out that rail shipments are faster for long distance deliveries; it takes only five days to move freight by rail from Boston to Los Angeles.

We are constantly shipping raw materials between our plants on both sides of the country and figure on two-week schedules. At no time has anything ever been received faster than ten days

in good weather and usually two days longer in the winter months. On the other hand, we have received cross-country shipments by truck in six or seven days.

I think a further explanation of his statement would be helpful so that some small company purchasing agent will not be misled or disappointed when using this type carrier.

G. D. Burnett,  
Purchasing Agent  
Monsanto Chemical Company  
Santa Clara, Calif.

- A number of purchasing agents and traffic managers were asked about the comments in Reader Burnett's letter. The almost unanimous response was that while there may be special circumstances in his case that result in 10 to 14 day coast-to-coast shipments by rail, many shipments are delivered in five days—or six at the most.

### ACROSS THE BORDER

Dear Sir:

We would appreciate your assistance in suggesting an American source of supply for a material similar to the attached sample. The material is to be used for an auxiliary car cushion.

Also, we are interested in learning where we can obtain fiber-glass thread in the United States. Any information you can give will be of great value.

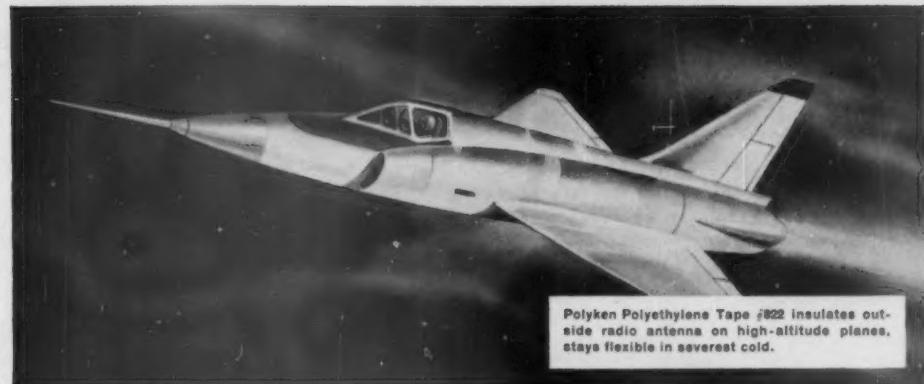
A. B. Cooke  
Pyrexon Ray Company Limited  
Toronto, Ontario

- As far as we can determine, the only source of fiberglass thread is Owens Corning Fiberglas Company. The sample you supply of woven paper fabric might be obtained from the following sources: Fibre Cloth, Lyndhurst, N. J.; Sackner Products Company, Grand Rapids, Mich.; E. W. Twitchell Inc., Phila., Penna.; and American Twine and Fabric Corp., Boston, Mass.

**Whatever  
the  
condition...**

**the  
climate...**

**the job...**



INSULATING • SEALING • WATERPROOFING • BINDING  
PROTECTING • PACKAGING • REINFORCING • MASKING  
HOLDING • BONDING • SPLICING • HEAT-SEALING

# There's a Polyken Tape to solve your problem

A jet slices through the thin stratospheric air in -70° F. cold. A pipeline carries precious oil across miles of desert waste under a broiling sun. Both do their jobs helped by modern Polyken tapes.

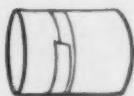
Within this complete and versatile line are tapes that can solve your particular problem regardless of climatic extremes of temperature and humidity,

under severe conditions of stress and corrosion. Tapes designed for dozens of uses in thousands of areas of production, packaging, and shipping. For the tape-answers to *your* needs, phone your nearest Polyken Industrial Tape Distributor. Or write to Polyken Sales Division, Dept. P-5, 309 W. Jackson Blvd., Chicago 6, Illinois.

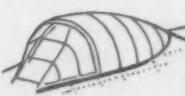
**Three of a Thousand Ways Polyken Can Work for You:**



Polyken Fiberglas Tape effectively seals heating duct joints despite constant high temperatures.



Polyken Waterproof Packaging Tape protects drums of costly pharmaceuticals from water, air, dust.



Polyken Surface Protection Tape guards "soft" plexiglass cockpit canopy, yet comes off clean and easy.

# Polyken®

**INDUSTRIAL TAPES**

**THE KENDALL COMPANY**  
**Polyken Sales Division**

For More Information Write No. 224 on Inquiry Card—Page 34

## Purchasing People In The News

The Miller Brewing Co., Milwaukee, Wisc., has announced the appointment of **Edward C. Van Beckum** as assistant purchasing



E. C. Van Beckum

agent. Mr. Van Beckum previously was Miller's employment manager. He joined Miller in 1947 as assistant paymaster. He is a graduate of Marquette University's school of business administration.

The Anaconda Company has made the following appointments: Thomas K. Davis, district purchasing agent at Salt Lake City, has been transferred to Butte, Mont., as assistant western general purchasing agent. Mr. Davis joined the organization at Salt Lake City in 1925 as an invoice clerk in the purchasing department. He became buyer and then assistant purchasing agent. In 1952 he was named purchasing agent, and in 1954 district purchasing agent.

Ralph Millard who has been storekeeper and also has handled local purchasing at Grants, N. M., is being transferred to Butte, Mont., with the title of assistant purchasing agent. Mr. Millard came to Anaconda at Great Falls, Mont., in 1929. He became assistant storekeeper there in 1942. From 1947 until 1952 Mr. Millard worked in the supply and purchasing departments of the company at Butte, Mont., and its

South American subsidiary in Chile. In 1953 he was appointed to the position of storekeeper at Grants, N. M.

Appointment of **Dennis P. Haggerty** as buyer for **SKF Industries, Inc., Philadelphia, Pa.** has been announced. Mr. Haggerty joined the ball and roller bearing manufacturer in 1955 and formerly served as a purchasing expediter. In his new capacity, he will negotiate material purchase contracts involving maintenance, repair and operating supplies for SKF Industries, Inc. Mr. Haggerty is attending the University of Pennsylvania.

**Leroy Champion** has been appointed purchasing agent for **Beaird-Poulan Inc., Shreveport,**



Leroy Champion

**La. Mr. Champion** joined the Arizona Edison Company, and later became associated with the J. B. Beaird Company.

**Martin Kirchhoefer** has been named director of purchases for **Consolidated Water Power & Paper Company, Wisconsin Rapids, Wisc.** Mr. Kirchhoefer, who succeeds the late **Vinson Krapfel**, will also direct the purchases for the company's United States subsidiaries and associated companies. Mr. Kirchhoefer

served as purchasing department engineer from 1945 to 1957. Since then he has been heading the company's industrial engineering department. He is a graduate of Valparaiso University with a major in industrial engineering.

Appointment of **Thomas W. Lawless** as purchasing agent of **Weaver Manufacturing Co., division of Dura Corporation, Springfield, Ill.**



Thomas W. Lawless

field, Ill. has been announced. He succeeds **Orville W. Ellis**, who is retiring after 40 years' service as purchasing agent for Weaver. Mr. Lawless comes to the post with 25 years' experience in purchasing—11 years with the Chicago & Illinois Midland Railroad and 14 with Heineke Co., Springfield.

**R. Ralph Hibbard** has been appointed assistant general purchasing agent of the **United States Envelope Company, Springfield, Mass.** Mr. Hibbard has been in the purchasing department of the general offices of the company since 1956, following a year's sales training with the Kellogg Envelope Division, Springfield. He is chairman of the Commodity Report Committee of the Purchasing Agents' Association of Western Mass. He attended Williams College.

For More Information about ad on facing page Write No. 225 on Inquiry Card→  
Purchasing

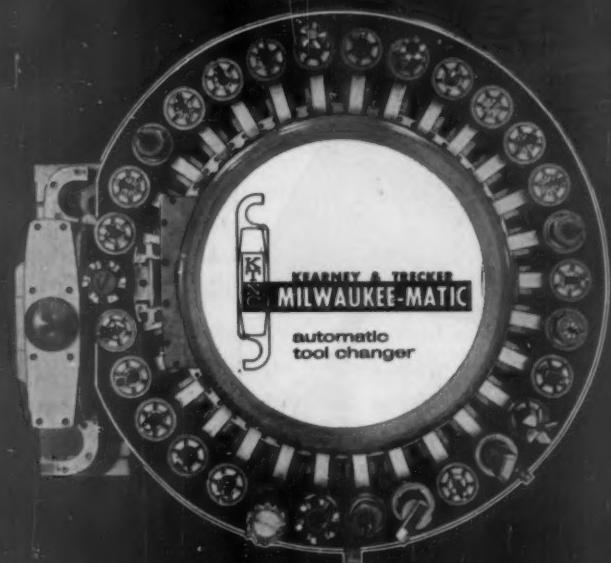


# the red tape that cuts costs...

... feeds instructions to the Kearney & Trecker MILWAUKEE-MATIC with speed and accuracy far beyond human ability. Modern control is just a part of the new MILWAUKEE-MATIC manufacturing concept that changes production schedules from Months to Minutes. The MILWAUKEE-MATIC is a complete machining center which unifies milling, drilling, boring, reaming and tapping operations into a single, numerically controlled unit.

Write for complete literature file, or call your local Kearney & Trecker representative today.

Numerical Control Division



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## **FOB—"filosofy of buying"**



Tokheim Purchasing Agent Ray Laughlin consults with Reverend Bryant Howard on the church budget.

ONE OF THE MARKS of an executive, according to an article in Tokheim Corporation's house organ, *Progress News*, is the ability to "wear well" with people. It asks, "Do people ask you to lead them—as an officer of social, fraternal, or religious organizations?" One Tokheim executive who can answer "yes" is Purchasing Agent Ray Laughlin, who is chairman of the Forest Park Methodist Church (Fort Wayne, Ind.) finance committee. The photo above appeared with the article.

• • •

MANY N.A.P.A. members may not have known her, but all benefitted from her loyal and efficient work for the association, so on their behalf we offer a special word of appreciation and congratulation to Miss Sarah Farkas on her retirement after 30 years of service. "Call Miss Farkas" was a byword around this office when any question concerning the association came up and invariably every call produced a courteous and helpful answer. We wish her all the pleasures of a happy retirement.

IT'S ONE OF THE babies of N.A.P.A., but the Purchasing Agents Association of Evansville has already scored a major public relations coup. In conjunction with the visit of N.A.P.A. President Tom English to the association in March, it arranged for Evansville's Mayor Frank McDonald to proclaim a Purchasing Agents Week. The proclamation speaks for itself:

"WHEREAS, in this country of ours wherein we enjoy so high a standard of living, the role played by the purchasing profession as a means to this end is often overlooked, if it is not disregarded, by most people; and

"WHEREAS, this is natural enough perhaps since purchasing has become an integral part of our lives without our realizing it. Purchasing of the right product from raw materials to the finished products and services at the right price, has given everyone quality products from the necessities to the luxuries of life at the best possible price; and

"WHEREAS, it is purchasing in all its many forms, that has brought savings in pro-

duction and distribution costs, that has ultimately passed on to the consumer to bring most products within the reach of the average person; and

"WHEREAS, this is truly important and it is fitting that we recognize the purchasing profession, which is so essential to our well-being and our economy, and that the citizens of this city join with others in saluting the purchasing profession.

"NOW, THEREFORE, I, Frank F. McDonald, Mayor of the City of Evansville, Indiana, do hereby proclaim March 6-12 as

PURCHASING AGENTS  
WEEK

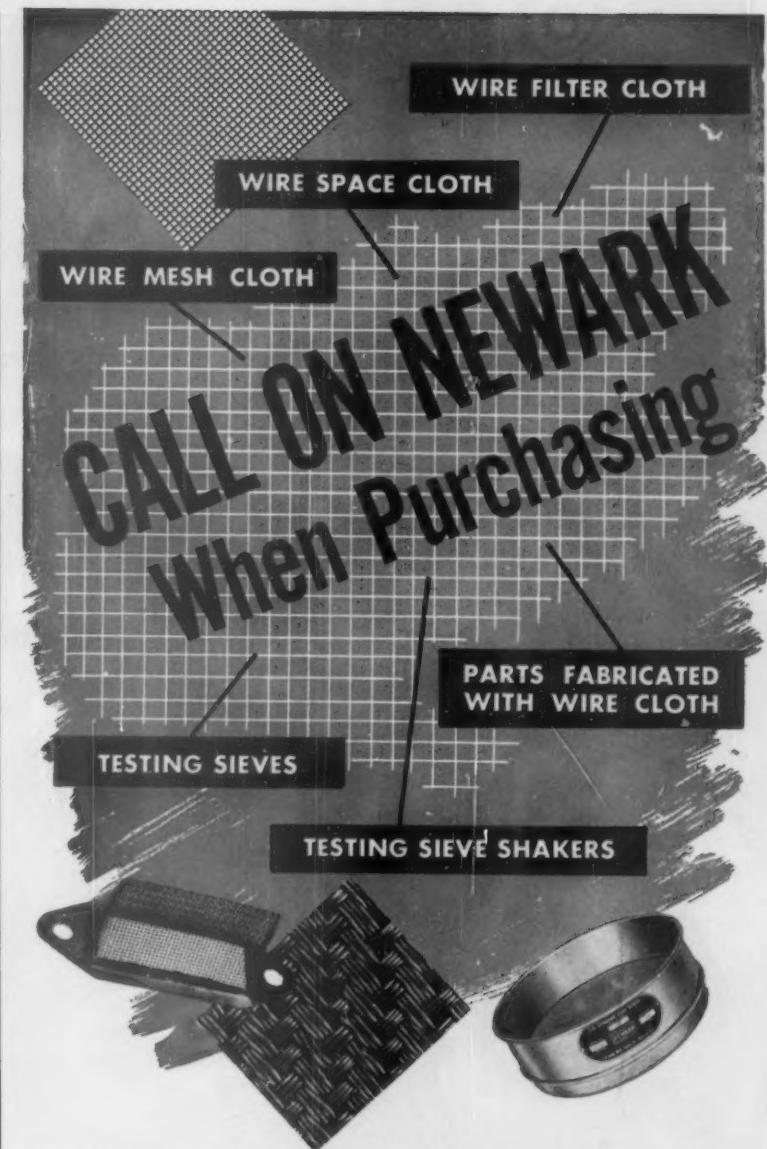
IN WITNESS WHEREOF, I hereunto set my hand and cause the Seal of the City of Evansville to be affixed this 19th day of February 1960.

(Signed)  
Frank F. McDonald—Mayor

PROBABLY the only Permanent Floating Purchasing Dixieland Jazz Band in, shall we say, captivity belongs to the Purchasing Agents Association of North Jersey. These cats, all genuine purchasing men, appear every year at the association's June meeting, and give out with le jazz hot and le jazz cool. Among the performers are Charlie Messner of Federal Telephone, one of the well-known Five Messner Brothers who were famous during the Twenties and Thirties, and Art Ostrander of the Aluminum Company of America, who played with the A & P Gypsies. We'd like to point out for the benefit of some of our younger readers that the A & P Gypsies are not crooked supermarket clerks. They were a group of musicians who built a fine reputation during the days when only the radio was available to disturb the peace and quiet of the American home.

The next appearance of this all-star jazz band will be at North Jersey's June meeting.

MAY 23, 1960



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There are a lot of good brass mills with good facilities turning out good brass. But there is a difference at Bristol Brass . . . it's the veteran mill men whose *first* and *only* nature is to produce brass sheet, rod and wire in real "Bristol-Fashion". Brass that meets exacting specifications . . . delivered on time. The BRISTOL BRASS CORPORATION. For 110 years, makers of Brass strip, rod and wire in Bristol, Connecticut. Bristol Brass has offices or warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse. *And for brass forgings, too . . .* Accurate Brass Corp. (Subsidiary of The Bristol Brass Corp.), Bristol, Connecticut.

**"BRISTOL FASHION" MEANS BRASS AT ITS BEST**

For More Information Write No. 228 on Inquiry Card—Page 34

# In Purchasing...

WHO said purchasing departments should stick to buying? The major editorial in this issue describes the purchasing department of the Ford Division of the Ford Motor Co. which has three basic assignments:



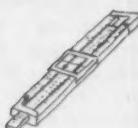
- (1) Getting maximum value on \$2 billion worth of purchases each year.
- (2) Estimating costs on proposed new models to guide styling and engineering towards the most economic designs.
- (3) Acting as one of management's major cost controls over the activities of Ford manufacturing plants employing more than 80,000 persons.

Thus, Ford Division purchasing maintains complete value control from the moment management conceives an idea for a new product to the time when the product is eventually phased out of production to be replaced by next year's model. Purchasing is management's cost control at Ford.

**Theme of the major editorial is purchasing's important role in developing Ford's fabulously successful compact car, the Falcon.** Frankly, we think this story, which starts on page 52, is one of the best we've ever published.

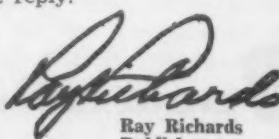
Ford Motor purchasing and PURCHASING Magazine made purchasing history twelve years ago when we described, for the first time, Ford's breakthrough in introducing purchase analysis to American industry. Many readers still have copies of this award-winning issue. We think they will find this one worth saving too.

Interesting as the Ford Falcon purchasing story is, it won't be all that you will find worth reading in this issue. Look for these additional outstanding features:



**Case Histories.** This issue contains nearly 400 case histories of how companies reduced cost through value analysis. They are designed to give readers ideas on how to reduce costs in their own companies. Case histories are broken down by basic type of commodity for your convenience.

**Reader Service Card.** Both case histories and advertisements are numbered. To get more information about products described in either, simply circle the appropriate number on the postage-paid Reader Service Card on page 34. You'll get a prompt reply.

  
Ray Richards  
Publisher

MAY 23, 1960

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Centralab service**

**buy-words**

**in electronic  
components**

**Electronic Switches**

**Variable Resistors—Potentiometers**

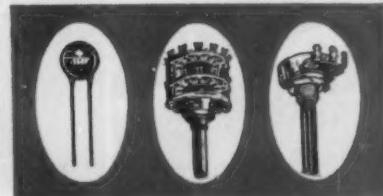
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CENTRALAB offers both "custom-built" components and a wide range of stock units. In either category, you get outstanding quality and efficient service. Your CENTRALAB sales representative will gladly work with you to see that your needs are met. Call him; he's a good man to know.

CENTRALAB stock units are available in industrial quantities through local distributors. Your CENTRALAB industrial distributor offers you factory prices and fast local delivery. Write for your free copy of Catalog 31 listing over 1700 items as well as sales offices in your area.



**Centralab**

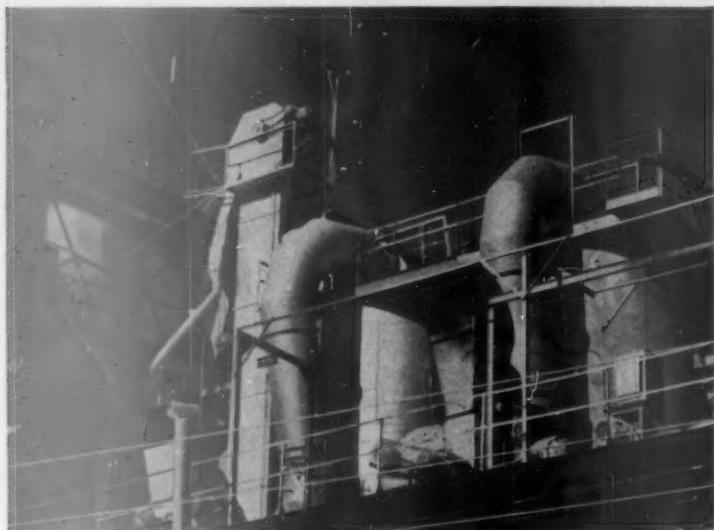
G-6013 

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on Inquiry Card—Page 34

# Found: A Paint that Lasts



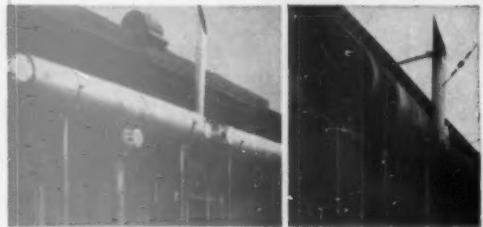
## Cut Costs with New Long-Lived Silicone Finishes

You paint your plant to protect against rust and rot, but how can you protect the paint? Sun, rain, heat, sleet, smoke, and other elements of the industrial climate take a heavy toll. Shortly after the paint is completely dry, it starts to deteriorate. Soon, it must be re-applied. Thus, the cost of keeping away rust can run high: not due to the price of the coating material as much as to the repainting time involved.

Now, however, new paints based on silicone resins make it possible for you to make some really substantial cuts in paint maintenance costs. Proven to have superior durability, these silicone finishes last a good 25% to 100% longer. They keep their gloss and color and film integrity despite tough exposure to weather . . . despite high temperatures that burn or crack conventional finishes.

Naturally, this greater staying power means fewer repainting jobs. And that's especially important in hard-to-get-at areas of the plant, or on hot-running equipment that must be shut down for painting.

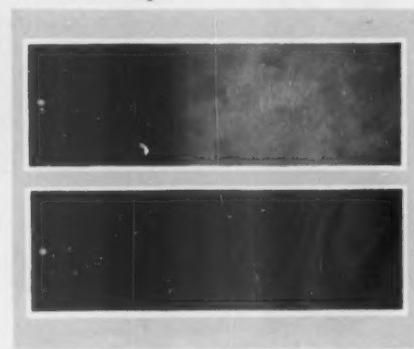
For instance, the Austin White Lime Company, of Austin, Texas, had difficulty keeping paint on the kilns and stacks shown above. Then they tried a paint based on Dow Corning Silicones, and report it "... by far the most satisfactory paint we have ever used." You can see the gleaming results.



Many other firms have come to the same conclusion. At left are two diesel mufflers at the Philadelphia Gas Works. Both were painted two years before these pictures were taken; one with an organic coating, the

other with a silicone finish. The burned, cracked and discolored paint is the organic; the "like-new" coating is the silicone.

What if there's no heat problem, just weathering? New silicone-based coatings outlast conventional paints even where high temperatures are no problem. Look at the test panels in the photo. These panels have been exposed for one year in an industrial location where corrosive atmospheres frequently prevail. The conventional organic paint has faded, lost its gloss and chalked badly, while the silicone finish (bottom) is still in fine shape.



**Colors Unlimited . . .** Silicone finishes run the complete spectrum. If you want a hot-spot finish that will resist 1,000 F, certain pigments such as aluminum must be used.

But, when temperatures are not high enough to damage the pigment, you can get virtually any color you wish. This is important, for it means that, for the first time, you can carry color-coding systems over onto hot equipment without worrying about early paint failures.

**Product finishes** based on Dow Corning Silicones further prove the resistance to chalking, checking, fading and oxidation of these resins. For example: Sherer-Gillett, Marshall, Mich., a major producer of refrigerator display cases for supermarkets, has found silicone-based enamel superior in durability . . . retaining high gloss after long wear . . . capable of absorbing more abuse.

Why not investigate silicone paints for your plant? Send today for the descriptive brochure. "Why Silicone-Based Paints Mean Less Maintenance." Write Dept. 2005.

Your nearest Dow Corning office is your number one source for latest information and technical service on silicones.



**Dow Corning CORPORATION**  
MIDLAND, MICHIGAN

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## Value Analysis Pointers

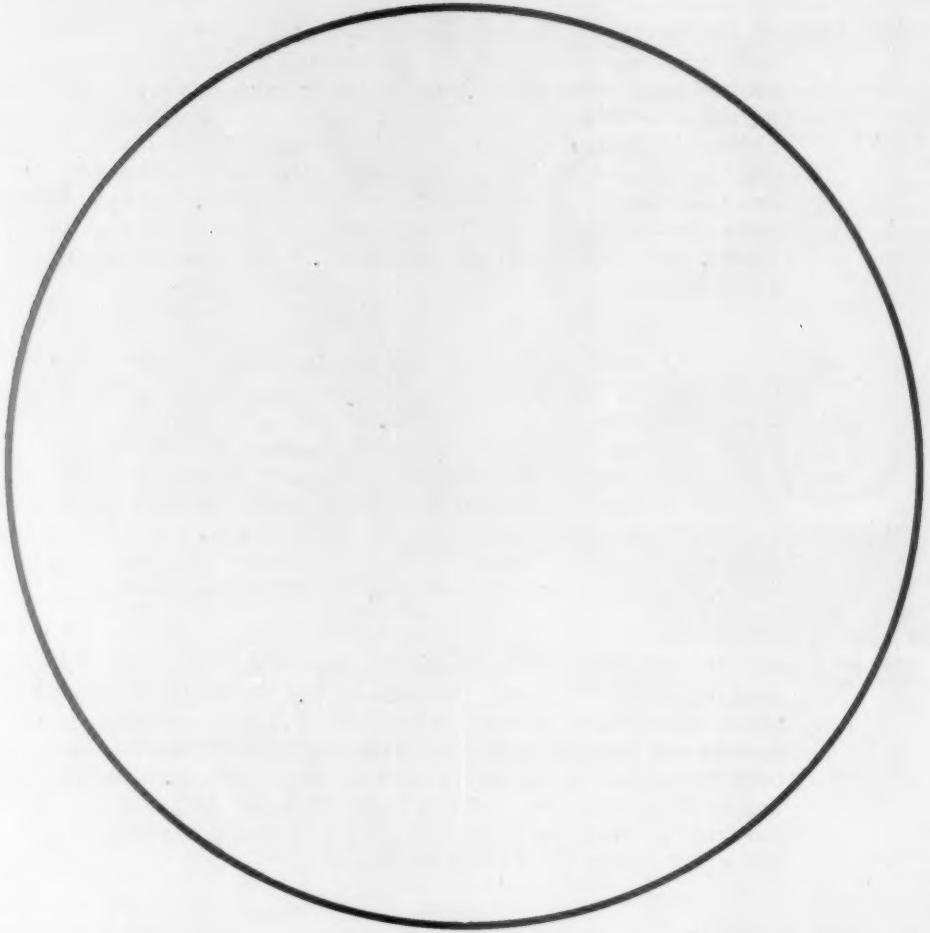
KEEP VENDORS VALUE-MINDED-Vendor participation is probably an important part of every value analysis program going. Lobby displays, vendor suggestion boxes, and requests for value analysis help on purchase orders are all helpful. But how many purchasing departments follow-up and publicize a vendor's contribution. You may tell your department and company personnel about it, but why not tell the world about it-in lobby displays, and in newspaper and magazine articles? It will stimulate the vendor to new ideas, and what's just as important, it'll stimulate his competitors too.

GOOD ANALYSTS DON'T BARK OR BLEAT-A man may have outstanding qualifications for the job of value analyst-technical background, good sense of value, inquiring mind, etc.-yet be a threat to the whole program, if he can't or won't make his moves at the right times. Stay away from over-aggressive or over-timid fellows when picking your analysts warns General Electric's Larry Miles. The over-aggressive man will get things done, but he'll wreck your organization doing it. And the over-timid man simply won't get anything done for fear of offending someone.

GET EVERYBODY IN THE ACT-Westinghouse has two rules that help to eliminate interdepartmental jealousies and suspicions, and to promote teamwork on cost reduction. All cost reductions reported are audited by a disinterested department; credit for a cost reduction is not split between departments. When engineering originates a cost-saving idea, it knows it can call on purchasing for help on vendor contacts, negotiation, etc. and still claim the saving as its own.

IS THERE AN ANALYST IN THE HOUSE?-If management balks at the expense of a full-time value analyst, offer them a profitable free sample. Ask for the services of a bright young man from engineering or production on a part-time basis-perhaps two mornings a week. Give him a quick indoctrination in value analysis and put him to work on a couple of promising items you've been watching but haven't been able to get to. It's almost a sure bet he'll come up with some kind of a saving in a relatively short time. If you can convince management that this is only a taste of what really can be done, you're on your way to getting approval for a full-scale program.

YOU CAN READ ALL ABOUT IT-Have you started your value analysis library yet? Two good basic publications you should have: the National Association of Purchasing Agents booklet "Cutting Costs By Analyzing Values" (available only to members); PURCHASING Magazine's reprint, "Applied Value Analysis." Additional copies of this special Value Analysis Issue will also be available following publication. Supply is limited, however, and copies will be sold on a first-come-first-served basis at \$1.50 each.



**How many segments can you cut this circle into with four straight lines?**  
The first quick answer is, of course, eight. Obvious—but not the whole answer!

Actually you can make as many as 11 segments with just four straight lines. Looking beyond the obvious *often* pays dividends. At Ryerson we've made a science of this—and call it *Metalogics*.

How does Metalogics work for you? It helps you value-analyze any kind of problem in the selection and application of steel, aluminum, plastics, and metal-fabricating machinery. It searches out money-saving and money-making ideas and shows you how to apply them. And then it follows through with day-in-day-out service and also goes "beyond the obvious" in caliber and scope and dependability.

Ask your Ryerson representative to show how you can get the greatest possible value from this unique Ryerson service. He'll be glad to tell you—and you may be very glad you asked. (Incidentally, for answer to the segmented circle see page 228.) Joseph T. Ryerson & Son, Inc.—Service Center Plants Coast to Coast.

For More Information Write No. 231 on Inquiry Card—Page 34



## Purchasing At Its Best

THE PURCHASING department described in the following pages may be the biggest centralized buying organization in the world. Certainly, it has one of the broadest, most complex and most significant set of responsibilities ever given to purchasing.

Ford Division purchasing buys billions of dollars worth of parts and materials; for Ford automobiles and trucks; it is the guardian of costs from the earliest stages of product planning to the time assembly lines are shut down for model changeover; it helps keep other Ford divisions competitive by applying the same scientific approach to intra-company buying that it does to outside purchases.

It will hardly be surprising if the average purchasing agent reacts to the Ford story with a mixture of awe and dismay. He will undoubtedly be impressed by the size of the organization and the advanced purchasing techniques it uses. But he might be discouraged by the wide disparity between his resources and those available to Ford purchasing. The auto company's cost and purchase analysis group, for example, has about 180 people; most small company purchasing agents feel lucky if they can get one.

There is no cause, however, for the small-company P.A. to throw up his hands and despair that he could ever do—even on a limited scale—what Ford purchasing has done. It has been shown many times that the difference between a first-rate large purchasing department and a first-rate small one is more a matter of degree than of kind.

Ford's purchasing achievement is, it is true, extraordinary. It may be years before any great numbers of companies adopt its methods. But on reflection, any purchasing agent will realize that Ford has simply carried to a logical conclusion the claims we have all been making for purchasing.

These are the claims: that purchasing is a basic business function best left to specialists who have responsibility and authority; that purchasing's full value cannot be fully exploited until it begins to function *before* costs are built into a product design; that purchasing is in the best position to set target costs on components and materials and measure how well they are met.

Ford purchasing has proved that the claims are valid. If you feel that they deserve a test in your company, a study of the Ford operation will give you both inspiration and practical ideas to start with.

*Paul V. Farrell*



## The Purchasing Department:

# FORD's Cost Control Center

*Buying is just one of three big jobs Ford Division management assigns its purchasing department. Purchasing also guides styling and engineering of new models and helps keep Ford manufacturing plants competitive.*

THE NEW Falcon car is so successful that even many Ford Motor Company executives are surprised. It became the best selling compact car within three months of its introduction. Current production is more than 2000 units per day which is about three times the company's original expectations.

### Purchasing and the Falcon

What are the reasons for the Falcon's enthusiastic acceptance by consumers? Two key reasons are the car's low price and its good design. Both its design and its cost result, in part, from the efforts of the purchasing department.

Ford purchasing played a major role in helping shape the decisions that led to the creation of the Falcon and its manufacture at costs below those of its major

competitors. In no other company in the world does purchasing have as broad a cost control assignment as it does at Ford.

Earl G. Ward, vice president-purchasing, is the top purchasing official at Ford Motor. He directly supervises a central purchasing staff and is also responsible functionally for purchasing offices at each Ford Motor Co. division.

Biggest divisional buying job is that of Charles Bosworth, general purchasing agent of the Ford Division. Bosworth spends upwards of \$2 billion per year for the parts that are assembled directly into all the cars and trucks made by the Ford Motor Company. As if this job weren't big enough, Ford Division purchasing has two other jobs that are also vital to the company's success:

(1) Making cost estimates which guide new product plan-

ning. Ideas for entire vehicles or components may be accepted or rejected on the basis of purchasing's cost information. Ford vehicles are competitive component-by-component because a 180-man purchase analysis department estimates the cost of every feasible design long before final engineering information is available.

### Tight Control by Purchasing

(2) Purchasing helps keep Ford manufacturing plants competitive. There are no high cost manufacturing operations eating up profits at Ford Motor; Ford plants must produce their products at market prices negotiated with purchasing. Tight control by purchasing of inter-divisional prices helps guide company expansion funds into the most profitable areas.

Ford's approach may be a genuine breakthrough in industrial organization and management. The typical purchasing department performs only one of the three basic jobs Ford purchasing handles—buying.

Most managers and many purchasing agents would no doubt react to the Ford approach with

A new Falcon takes the steep hill on Ford's test track with ease. Watching it are Ford Division General Manager J. O. Wright (l.) and General Purchasing Agent Charles Bosworth. Management's demands on purchasing are fully appreciated by Wright who has served as assistant general purchasing agent of the Ford Division and director of purchases. Wright relied on Bosworth's department for the cost data that guided design decisions on the Falcon in addition to its buying job.



## ford's cost control center

the remark that "purchasing should stick to buying and leave the cost control to people that know something about it."

Similarly, fifty years ago, most managers would have said, "buying should be done by manufacturing superintendents and engineers because the men who use and specify the material know best what is needed." But managements gradually realized there was a difference between buying skill and specifying skill; they discovered that professional purchasing men could buy better materials at lower prices than engineers and shop superintendents.

Ford's approach to purchasing may be just as important a discovery. It works because it's logical. Someone has to guide engineers and stylists with information on relative costs. Should it be, as it is in many companies, an engineer who is not trained in cost estimating? Or should it be, as it is in most companies, a cost accountant who acts as a middleman passing technical information from engineering on to purchasing and manufacturing for cost estimates? Instead, why not have an estimator in purchasing who has had both cost accounting and manufacturing training? Working with engineers and suppliers, he can provide cost information sooner. He can also make certain that the design that is theoretically lowest in cost is also lowest when it is actually purchased.

### Purchasing as Watchdog

Similarly, why not have purchasing as cost watchdog of manufacturing plants? Many companies have captive plants which manufacture components. These plants pass their output on at cost to other company divisions. Instead, why not make them meet the test of the market as Ford does and subject their prices to the scrutiny of the purchasing department?

The purchasing department that performs these vital jobs for the Ford Division is very big (almost 500 people). It is also a young organization.

### Accent on Youth

General Purchasing Agent Charles Bosworth is 44. He's older than all but four of his 12 top department heads; he's one of the few executives who will delegate tremendous responsibility to men in their mid-thirties. For example, L. H. Hyde, purchasing agent of the machined parts department, is responsible for about \$750,000,000 worth of purchases. His age: 35. John Secrest, manager of purchase analysis, supervises 180 people who provide the cost data that guide product planning decisions that are vital to Ford. Secrest is 12 years out of the Harvard Business School.

Bosworth's two staff department heads, C. T. Stuart, manager of purchasing administration, and C. L. Ewald, manager of procurement planning, could pass as young college instructors. A number of section supervisors and senior buyers are also relative youngsters; almost all are under 45.

Since Ford is an old company (founded in 1903), the average age of purchasing executives is one barometer that illustrates the growth in importance of purchasing. Ford Division purchasing has tripled in size in the last seven years because of its added responsibilities. This growth has created many new, important jobs for younger men.

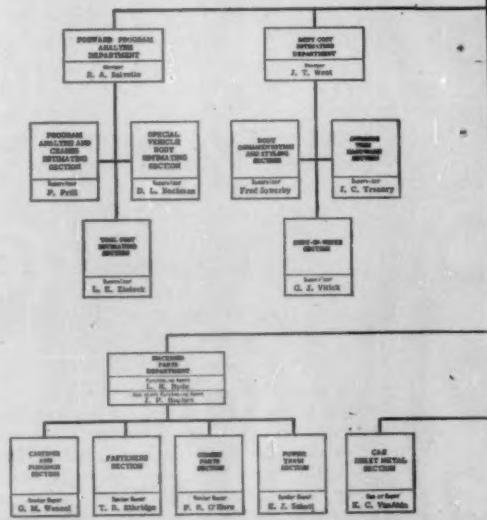
One Ford executive half jokingly attributes the youthfulness of Ford Division purchasing men to the fact that the job pressures are so great that no one lives long enough to get old. But, of course, purchasing does have its old timers like Purchasing Agent Leonard Heinle who has thrived

on the pressure of automotive buying ever since he joined Ford Motor in 1922.

It's true, however, that Ford purchasing men are subject to more pressure than their counterparts in many other companies, despite the fact that they should theoretically have much easier jobs. By most standards, Ford Division purchasing has an enormous staff of highly skilled manpower available to do its job. With its staff of 500 it issued about 85,000 purchase orders last year. This is an average of 170 purchase orders per person per year—just a little less than three orders per person per week.

If an accountant were to tabulate Ford Division's cost per order in the usual fashion—dividing

Ford's purchasing organization is uniquely tailored for extremely close control of every operation. Span of supervision is quite narrow; jobs are highly specialized. A 180-man purchase analysis department provides services performed in no other purchasing department in the world.





**John Secrest directs Ford's 180-man purchase analysis department.**

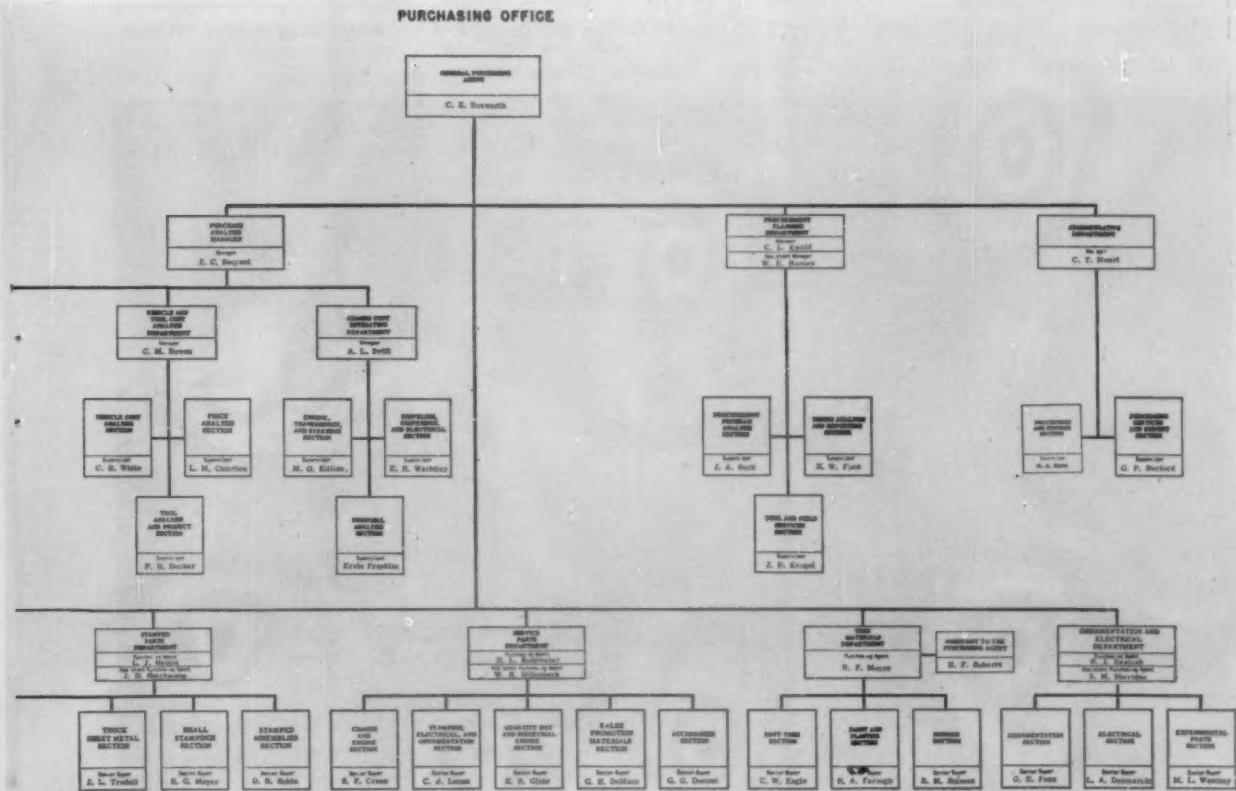
purchasing department operating costs, including salaries, by the number of orders issued—he would be shocked. The cost would be extremely high—close to \$58 per order.

Is this a sign of inefficiency? It would be if purchasing were strictly a clerical operation—if the

job could be done by clerks tabulating bids, typing orders, and posting records, etc. But purchasing could hardly be called a clerical function at Ford. An order that can be typed in ten minutes may call for the expenditure of millions of dollars and represents literally thousands of man-hours

of purchasing time spent investigating, analyzing, negotiating, etc.

Ford purchasing is a fantastically intensive operation because mistakes are so expensive and opportunities for huge savings are so great. Buyers will scramble to save pennies; each 1¢ saving on a Ford car brings a return of about





### ford's cost control center

\$10,000 per year. Pennies saved through pre-production purchase analysis and good buying add up to major cost reductions. It is no coincidence that the Falcon lists for \$70 less than its major competitor and still yields a good profit for Ford.

#### **Ulcer Candidates**

The high stakes aren't the only reason Ford purchasing people are good candidates for ulcers and high blood pressure, however. The real problem is the car-buying public. Its tastes are both fickle and unpredictable. A car that is a dog one year may be a best seller a few years later. Auto manufacturers are in the unhappy position of having to anticipate public taste and demand about two or three years ahead—the time it takes to style, engineer, tool and test a new model.

Unfortunately, the public's taste

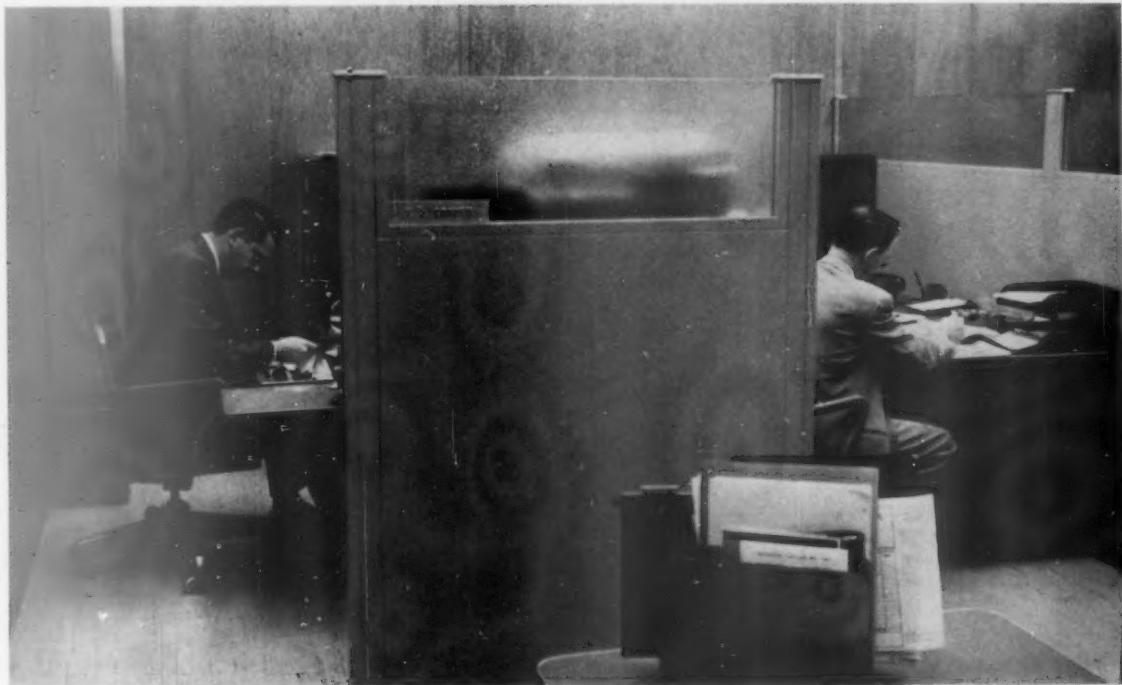
can change almost overnight. Measuring it is an inexact job at best. The only way auto executives can win at the billion dollar game of guessing what the public wants is to be as flexible as possible. Ford keeps dozens of different product proposals in various stages of readiness. Naturally each of them involves considerable work for purchasing. Much of this work will never show up in a finished product, of course. The project may be shelved long before it ever reaches the tooling stage.

Because demand and tastes do change, Ford naturally avoids committing itself to a product before it is forced to do so. This means there's no time to relax on any new model program and, since there's at least one new model each year, the purchasing department is full of men in a hurry. Last minute design changes

on components compound the problem. On every new model there are a few components that are changed at the last minute; buyers and analysts must achieve the "impossible" to avoid delaying the world introduction and still keep within budget limits. While Henry Ford pioneered the 8-hour day in his factories nearly fifty years ago, it has yet to become standard practice for many Ford Division purchasing executives.

#### **Screen Out High Cost Items**

The Ford purchasing process is superficially simple. Suppliers quote and, if they are awarded the business, receive a purchase order that isn't the least bit unconventional. But behind this simple clerical procedure is a buying and analytical process that is so complex that few outsiders—even old line suppliers—can trace it from beginning to end. It's de-



Ford buyers have semi-private offices. There is one secretary for each two buyers.

signed to subject every component to such intensive scrutiny that it becomes almost impossible for unnecessarily high cost components to slip into end products undetected.

The process starts on a new car as much as three years before its introduction—even before there are crude sketches of the new model. At this initial stage, purchasing may get a memo which describes the proposed product change in a few hundred words. The memo may indicate length, width, height, and weight of a proposed new model along with body construction (unitized or conventional), type of engine, etc.

Purchase analysts know their jobs so well that they can provide remarkably accurate cost information even from such sketchy information. When purchasing says that a proposed new car with certain dimensions and features will cost \$20 more than the current design, management can be certain that even this rough estimate is accurate within 5-10%.

Many of purchasing's estimates are never refined beyond this preliminary stage. The design idea may be killed at this early stage because it looks too costly. This preliminary review by purchasing naturally helps save thousands of hours of engineering and styling time which would be necessary to prepare even a preliminary product study.

#### **Purchasing Has Vital Role**

When purchasing's cost estimate indicates that a product idea should be investigated further, the styling and engineering departments start to work developing a more detailed design. Purchasing continues to guide the new model from a cost standpoint. It may evaluate the relative cost of dozens of different possible designs for each key component. Even at this stage, purchase analysts are usually working without detailed specifications. They often have to develop cost estimates from stylist's sketches or by looking at clay models in the styling studios.

This styling and development phase may last a year for a given new model. Informal liaison among purchase analysts, stylists,



Competitors' vehicles are periodically torn apart and carefully analyzed by Ford purchasing. Here, analyzing sheet metal design are Purchase Analysts W. B. Thompson and George Vitick and Purchasing Agent Leonard Heinle.

product planners, and engineers will produce hundreds of changes that improve product or reduce cost.

However, the relationship isn't entirely informal. Everyone concerned with a new model is governed by a budget. All new Ford Division cars are developed for specific markets. Their cost must be closely controlled at each stage of design. The budget for a new model is broken down into sections—so much is budgeted for the body front end, so much for body ornamentation, so much for the engine, etc. Both the piece cost and tool cost (which can run

into millions of dollars even for a minor model changeover) must be controlled and there is a budget for each.

#### **Must Buy Within Budget**

Purchasing must buy within this budget; otherwise the division won't meet its pricing and profit objectives. This profit control system wouldn't work if purchasing did not participate in the early design stage. Without purchasing participation, buyers would be forced to pay prices to fit some arbitrarily determined budget. They would be faced with the hopeless job of trying to per-

Purchasing Agent R. J. Swatosh buys ornamental and electrical parts.

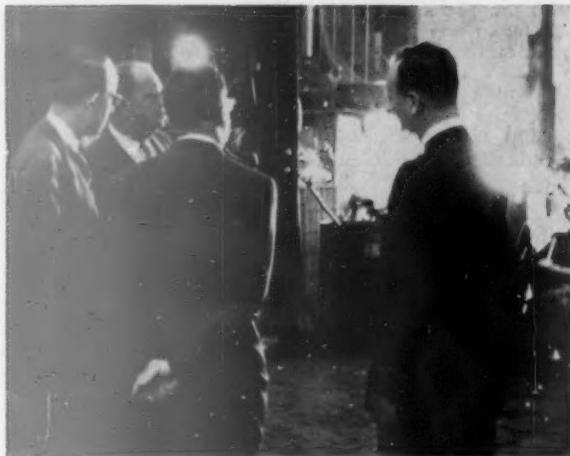




At the Dearborn Glass Plant, Ford P.A. Larry Hyde (left) and Senior Buyer G. M. Wencel watch glass coming off the end of the grind and polish line. With them are Plant Manager R. K. Eby, Sales Manager H. G. Bleeker, and Assistant Plant Manager W. Spodeck.



The hot metal from the foundry is eventually transformed into machined brake drums which Hyde and Steve Wilkinson of Kelsey Hayes watch passing by on overhead conveyor lines.



The following day, Hyde visited the foundry of the Kelsey Hayes Wheel Co.—a major Ford supplier of wheels, hubs, drums, etc. and viewed operations.

## No Chairborne Buyers At Ford

suade a supplier to make a \$1.00 item for 50¢.

With the Ford Division's system, purchase analysts estimate each design early enough so that there is almost always time to make changes if the design looks too costly for the budget. The design is approved only after full consideration of its cost vs. budget.

If either tool cost or piece cost estimates exceed the budget, the item gets more detailed consideration. Sometimes the design is approved anyway if it looks worthwhile. In such cases, the budget for other components will have

to be cut to keep over-all costs within budget. It is often possible to get the same design effect without exceeding budget by slight changes in specifications. Purchase analysts can frequently be quite helpful to stylists. For example they can point out precisely how severe the contours can be for glass or sheet metal parts before premium costs are incurred.

### Set Target Prices

Engineers often make substantial changes in the design of a component when they start trans-

lating stylists' sketches into blueprint. The engineer must get a structure that is sound and can be easily assembled with other components. He may also have to make further changes when the first hand-made cars are tested. Purchase analysis estimates the cost of all changes. It both guides the engineers to the most economic approaches and lets them know if the costs of other designs are within budget.

Purchase analysis estimates of key parts become target prices for the buyers. If a buyer gets a quote from a supplier that is substantially under the estimate,



Final plant visit of the week was to the Sterling Plant of the Ford Transmission and Chassis Division. Here, Hyde, Plant Manager J. A. McCabe, Sales Manager C. H. Clendening, R. R. Cosner, and Senior Buyer Ed Schott discuss material handling of axle tubes used on the Falcon.



Hyde and Buyer Ed Schott look at a component of the differential with R. R. Cosner of the Sterling plant.

Ford buyers and purchase analysts do more than rely on visiting salesmen to keep informed on production processes. They go to the vendor's plant and see for themselves. Even veteran purchasing agents, who have visited hundreds of supplier plants, try to get out of their offices as frequently as possible to keep up to date. For example, Purchasing Agent Larry Hyde likes to spend one week per month in supplier plants. He feels that only by actually seeing the plant and meeting its executives can he really get a feel for what a supplier can do. One man he never fails to meet is the supplier's purchasing agent. "If the P. A. doesn't know his business," says Hyde, "chances are the supplier won't measure up to our expectations." The pictures on this page show the visits Hyde made in a typical week.



The payoff from plant visits came when Hyde was shown this steering column. He could mentally visualize almost every operation involved in its manufacture.

both the quote and the estimate are checked for errors. If the supplier has made an error, it is called to his attention. If it appears that the supplier is trying to "buy" Ford business by selling at less than cost, the Ford buyer will not be deceived.

#### Charge Against Purchasing

In some cases, there is no error in either the supplier's quote or the estimate even though the vendor quote is below the estimate. Purchase analysis estimates are based on efficient processes and prevailing wage and overhead rates. If a supplier is ex-

tremely good at processing and cost control, he can beat the estimate and still make a healthy profit. If this is the case, the buyer accepts a quote below estimate.

If the supplier's quote is above the analyst's estimate, the buyer will try to negotiate a lower price or find a lower cost supplier. He will often request assistance from the purchase analyst. The senior buyer, the assistant purchasing agent, and the purchasing agent also often aid in negotiations. The buyer will naturally pay the higher price if he is forced to do so to get delivery. But the cost premium he pays will be charged

against purchasing in the Ford Division's profit plan. It will be reviewed monthly by the general purchasing agent and others to determine what specific plans the buying department has for bringing the over-budget item into line.

#### Make It Themselves

If the high price indicates the supplier is making an exorbitant profit, the buyer will naturally look for a supplier willing to settle for a more reasonable return on his investment. If he cannot find one, he may try to get a supplier with similar manufacturing know-how started on the com-



ford's cost control center



For its 1960 models, Ford Purchasing bought more than 30 million pieces of promotion material. Senior Buyer G. DeMann checks a Falcon catalog sheet for color register at the Graphic Arts Process Co.

ponent. Or he may recommend that the Ford manufacturing engineering department make a study of the component to see if it could profitably be made in a Ford plant.

When it is paying a premium for a part, purchasing never relents in its efforts to bring the price down near the purchase analysis estimate. And it never assumes that costs can't be cut just because prices are in line with estimates. Buyers keep pressure on suppliers to come up with new ideas, new materials, and new processes. Purchase analysts and buyers investigate every cost reduction idea that has any promise at all.

Ford purchasing doesn't hesitate to look to its competitors for new ideas. Every competitor's new model is promptly purchased for analysis and promptly torn apart. Purchase analysts patiently review the competitor's components and estimate costs. If a com-

petitor comes up with a new cost reduction idea, Ford knows about it in a short period of time.

Ford Division's major competitor, Chevrolet, gets special treatment. New Chevrolet models are dissected almost to the last nut and bolt. The cost of each component is estimated. Even the amount of body solder used to seal joints is methodically weighed. Comparable Chevrolet and Ford parts are mounted on boards side-by-side. When purchase analysis estimates show that the Chevrolet component is doing an equivalent job at lower cost, there may be changes in Ford's next model.

#### Designed for Close Control

Thus, any purchase that does not go according to plan (i.e., maximum value both absolutely and relative to competitors), gets intensive investigation by Ford Division purchasing. The organization is especially suited for such intensive efforts; its structure is

designed for extremely close control.

Span of supervision is quite narrow. Usually four buyers report to a senior buyer and each purchasing agent supervises three to four senior buyers (see organization chart, p. 54). This set-up permits senior buyers to become intimately acquainted with their buyers' problems. Since purchasing agents supervise but 12-15 buyers and have assistant purchasing agents to help them, they can jump in immediately and help when a problem arises.

Jobs in Ford purchasing are also extremely specialized. Buyers concentrate on certain commodities which they handle for all Ford Motor Company cars and trucks. They're expected to be experts at negotiation and source selection. They aren't expected to do clerical work; they have clerks to help them. Administrative groups in each buying department and in the Administrative Depart-



Ford Division purchasing not only buys for production; it must also keep depots stocked with current and past model service parts. Purchasing Agent H. L. Kohlmeier (far right) reviews muffler storage problems at the Detroit Parts Depot.

ment provide other services for the buyers such as filing, purchase order typing, etc.

#### When a Job Gets Hot . . .

Buyers are also assisted by C. L. Ewald's 40-man procurement planning department which handles many of the timing and expediting phases of the purchasing job. It keeps track of the flow of engineering information to the buyers to make certain there is sufficient lead time. It keeps track of progress on purchase order placement, construction of special

tools, and expedites sample, approval.

When a job gets "hot" because of delays, quality problems, or mandatory engineering changes, expeditors from procurement planning jump in to help the buyer. In many cases, they will literally live at the supplier's plant or his tool shop until the problem is solved.

Buyers get assistance on the pricing phase of their jobs too. Although each buyer is expected to be familiar with the principles of purchase analysis, he uses purchase analysts' cost estimates in

negotiation after he has carefully reviewed them with the analyst to make certain he is familiar with the cost levels and manufacturing processes which they are based on. Buyers and senior buyers handle negotiations; purchase analysts frequently assist, particularly on parts purchased from Ford manufacturing divisions.

#### Stress Specialization

There is also tremendous specialization among the 180 members of the purchase analysis department. Some analysts are expert report writers and cost accountants. They prepare long detailed analyses using data fed to them by other specialists in purchase analysis: the cost estimators.

Each cost estimator is a specialist in some phase of manufacturing. Usually he has held responsible jobs in methods, time study, or product cost estimating before he joined purchase analysis. Frequently 10-15 years practical experience in the shop are necessary before a man can hope to become a good estimator and then his skills are limited by the commodities he has worked with. Some estimators specialize in stampings, others in soft trim, etc. All the top estimators can talk authoritatively about processes, costs, direct labor minutes, overhead rates, etc., in their specialties. They have no trouble earning the respect of the shop su-

### Key Parts System Provides Economical, Accurate Control

Purchasing's intensive cost control system works well because it's highly selective. Analysts can get fast estimates of the cost of entire vehicles because they are concerned with only 400-500 parts and assemblies on the vehicles. Their estimates are accurate because these key parts account for nearly 95% of dollar volume. All parts costing more than 50¢ per car are key parts. In addition, all parts subject to frequent style change (e.g., outside body moldings), are key parts regardless of price.

By simply adding the cost changes on key parts, analysts can predict the effect of proposed design changes with tremendous accuracy. They can also readily compute the economic effect of changes in labor rates or material cost since they know the labor hours and material content of each key part.

If Ford management wants to know how much more it would cost to make a car 10" longer, purchase analysis can study the key parts involved and come up with a quick (but surprisingly

accurate) estimate in a few days. Or purchase analysis can advise management almost precisely what a steel price increase will do to the cost of each vehicle by multiplying the steel content of the key parts by the expected price increase.

The key parts concept is also used to control a new model that is in the process of being engineered. The latest purchase analysis estimates of designs for key parts are carefully compared with the budget. Discrepancies are carefully checked.



### ford's cost control center

perintendents and engineers they deal with at Ford and outside supplier plants.

Ford Division is the only purchasing department in the world with more purchase analysts than buyers. Purchase Analysis Manager John Secrest requires one person in his department for every 24 key parts that are controlled. Ford production buyers, like buyers in other companies, average about 300 parts each; one buyer of fasteners handles 939. Many analysts are needed because there may be literally hundreds of cost estimates necessary each year for the 24 key parts an average analyst handles. One of the analyst's major jobs is helping to weed out designs that are too costly long before engineering or the buyers waste their time on them.

Only a small percentage of the purchase analysis department's efforts are devoted to the traditional purchase analysis activities: review of purchased parts to generate ideas for cost reduction. Purchase analysis devotes most of its efforts to cost estimates that help management make certain



Will next year's Ford have a bumper impact bar like this one proposed by styling? The final decision will depend largely upon the cost evaluation being made by Cost Analysts H. Wolverton and N. Wolford, Senior Buyer Ken Van Akin and Cost Analyst L. Spanberger.

that the lowest cost design is released for production and that this design is purchased at the lowest possible cost. With this approach, savings are naturally near the maximum. They are difficult to measure however, because the higher costs that might result through uneconomical design or

uninformed buying never get through, so there's no way to measure how much is actually saved.

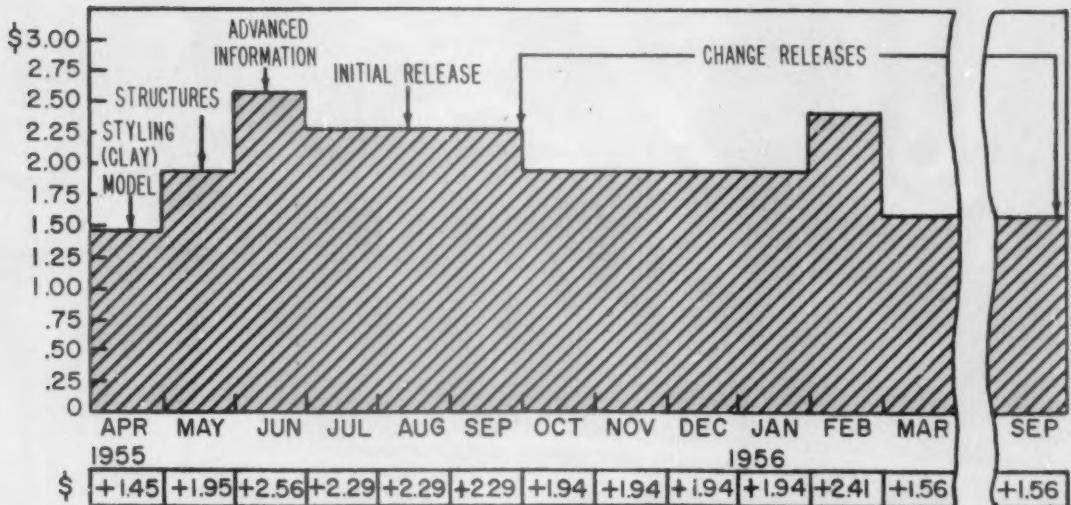
Ford management is convinced that its big investment (the annual budget is about \$2 million) in purchase analysis is one of its most profitable assets. The fabulous success of the Falcon car is proof that it is.

Further proof is provided by the millions of dollars Ford purchasing saves through value analysis. Buyers save through development of new sources, and use of purchase analysis price objectives.

**New Sources.** Five years ago, suppliers of stainless steel moldings were, with few exceptions, in the Detroit area where labor costs are very high. A few Ford suppliers located small manufacturing facilities in Kentucky, Georgia, and Florida. There, wages were but \$1.60-\$1.80 per hour compared with about \$2.30 in the northern industrial states. Other costs are also lower including land, heat, etc. Southern suppliers could easily underbid their northern competitors.



Buyers and purchase analysts are an unbeatable team for cost reduction. Purchase Analyst John Trenary and Buyer Curt H. Brindley discuss a new front seat side shield made from polyethylene that is not only superior in quality but also costs one-third less than the painted metal stamping formerly used.



Purchase analysis cost estimates guide management in planning new car models from their inception in styling to initial production. As design changes are made, purchase analysts revise their estimates and management knows precisely what each major component will cost. It can then make changes if it appears that costs will exceed budget.

Because purchasing was willing to assume the risk of sourcing to new plants and accept more difficult coordination because of the greater distance, it was able to reduce costs of moldings by 10-20%. Suppliers in the high labor cost areas have met these lower prices and retained a big share of the business because of substantial improvements in efficiency.

**Price Objectives.** Sometimes there is a wide gap between the purchase price and the purchase analysis objective. Four years ago, actual prices for a major group of parts exceeded the objective by \$4.5 per year. Buyers made a concentrated effort to reduce cost. They saved nearly \$2 million the first year and by 1960 the parts were in line with purchase analysis objectives.

#### How Ford Does It

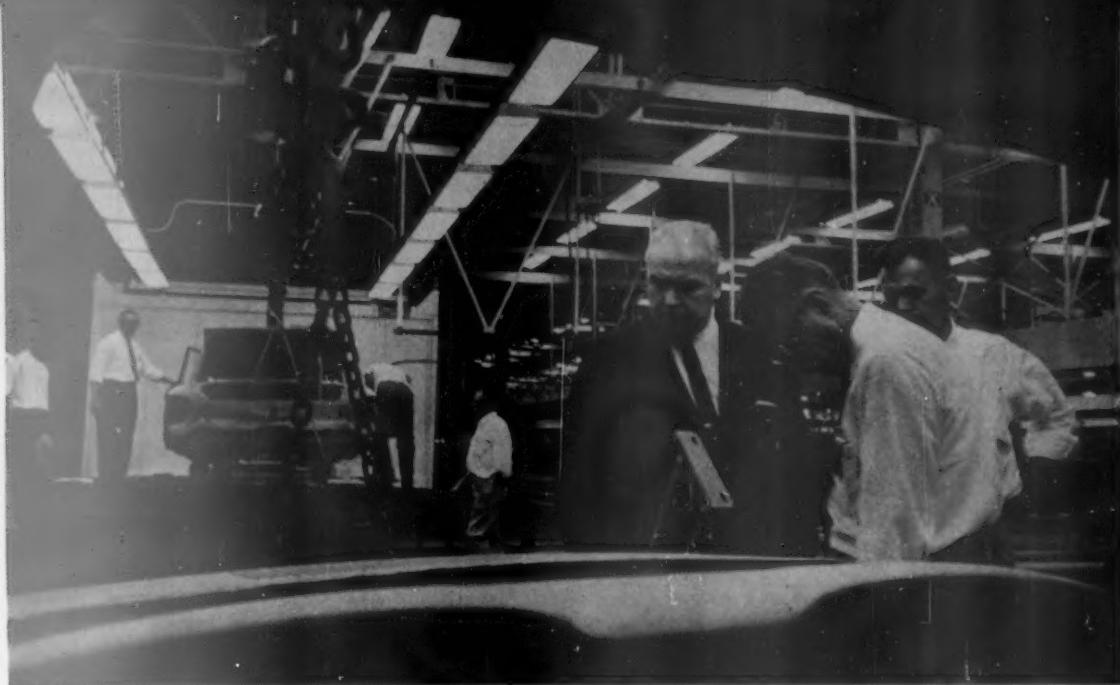
Ford gets results like these because it has the purchasing organization and the purchasing techniques to do the job. Both are described in detail in the five basic parts of this article.

Three of the four sections that follow describe in greater detail the three basic assignments Ford Division management gives its

purchasing department. The next describes how Ford purchasing helps plan new car models, with the Falcon used as the sample. Purchasing's other two assignments, controlling inter-divisional prices and buying, are described in detail. The last section deals with the personnel that buy for Ford.



Narrow span of control and job specialization in Ford purchasing permit supervisors to work closely with subordinates. Here, Buyer J. L. Langdon discusses a buying problem with his senior buyer, L. A. Desmarais.



The first Falcons were handmade on a pilot line last summer. Purchasing's part in creating the Falcon started about two years before when Ford management first seriously considered introducing a compact car.

## Purchasing Helps Create The Falcon

*Ford purchasing did more than just buy the parts for the new Falcon. It helped guide styling and engineering from the car's inception.*

FORD pushed hard to get the Falcon into dealer showrooms in October, 1959. Even so, development work on the car had started years before. Engineering had experimented with various small car designs since the early 1950's. The product planning department started the small car study that ultimately evolved into the Falcon in April, 1957. This study was touched off by the boom in small car sales which passed the 100,000 car-mark for the first time in history in 1956. Although it seemed likely that Ford wouldn't be interested in this small a market, product planning started its study anyway. It is product planning's job to anticipate demand for cars by the 2½-3 years necessary to develop new models. There was a

chance that the rising popularity of small cars foreshadowed a shift in demand.

Initial studies confirmed that cost of ownership of small cars was substantially lower, and sales of foreign cars continued to go up in 1957. So in July, 1957, product planning recommended that the company make a small car. Purchasing and engineering had already been called upon to help even at this early stage.

### Tear Cars Apart

The small car that product planning visualized was not much bigger than a Volkswagen or English Ford—with engine either in front or rear. To guide product planning, even at this early stage,

purchasing got Taunus, Volkswagen, and English Ford models and tore them apart. Purchase analysts made detailed cost estimates of the Volkswagen and the Taunus—piece by piece.

In these early stages, before management had given a definite green light to the program, the project group consisted of only 8-10 persons including a representative from the purchase analysis department.

As the compact car market grew during 1957, Ford top management became increasingly interested in the small car project. It was actively considering a number of possible designs of both 2300 lb. and 1700 lb. cars equipped with either 4 cylinder or 6 cylinder engines mounted either in the

front or the rear. Engineering feasibility studies were underway for all of these possible models. Styling produced a number of clay models of proposed designs and purchase analysis provided management with cost estimates of each.

In mid-1957, product planning gave a major presentation on small cars for Ford top management. About 20 or 30 models of foreign and domestic cars were displayed. Executives had a chance to test each and they also studied tentative proposals for various types of Ford small cars.

#### **Volks Not Best Value**

Purchasing's cost estimates revealed something that Ford top management might not have otherwise guessed: with American labor costs and manufacturing techniques, the Volkswagen-type vehicle (1700 lbs. with 4-cylinder air-cooled engine in the rear) was not the best value. Ford could make a heavier and much roomier car (weight about 2300 lbs. with a more powerful 6-cylinder engine) for only moderately higher costs.

So in March, not long after product planning's presentation, Ford's executive committee OK'd preliminary designs of a 6-cylinder front-mounted engine car and full scale engineering work commenced.

At the start, the market for the Falcon looked limited; initial tooling was for 160,000 cars per year. Purchasing tried to hold tooling costs to a minimum. It contacted suppliers of semi-standard components whenever possible; it hoped to buy modified versions of axles, transmissions, drive shafts, generators, etc. already in production for other vehicles.

#### **Hit by Recession**

With this approach it could save millions in special tooling. If volume stayed low, the decision would be an ideal one from a cost standpoint.

But the auto market continued to change and Ford purchasing had to change with it. In the midst of the 1958 recession, when car sales sagged badly and two of the Big Three were losing money, foreign car sales in the U.S. rose

100%. American Motors started the year with heavy accumulated losses; it ended 1958 with the best profit it had yet made. Surging demand for Ramblers did the trick.

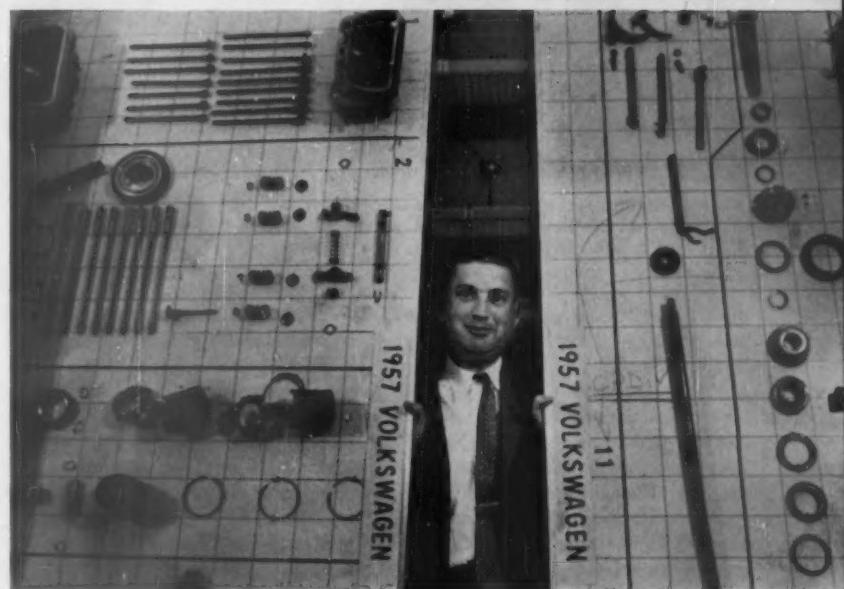
#### **Market Kept Growing**

The market for compact cars was growing and Ford upped its sights. Falcon tooling expenditures were increased to permit production of 300,000 vehicles, then 500,000. In a few months, capacity reached the point where Ford could produce 900,000 Falcons if the market seemed strong enough to absorb them.

These changing volume requirements meant tremendous changes in purchasing's planning. Semi-standard components, made by specialist suppliers who serve the entire auto industry are particularly economic when volume is low. As the Falcon volume grew, however, it became more eco-



→  
Purchase analysis started providing management with cost estimates of various possible designs of the Falcon long before precise blueprints were available. Its estimates of alternate concepts guided styling to designs that provided maximum style and utility within budget limitations.



The 1957 Volkswagen was one of several small cars that was torn apart, costed, and analyzed in detail by Ford purchase analysts. Components were mounted on display boards to permit easy comparison of like features of various models.



## purchasing helps build the falcon

nomic to consider major components like transmissions, axles, etc. that were designed exclusively for use on Ford cars. Because of recession cutbacks, Ford manufacturing plants became much more interested in Falcon business in 1958 than they were initially. Outside suppliers also had plenty of open capacity and they

when it could least afford to do so. The Falcon was naturally destined to be the lowest priced car in the Ford line; costs had to be held closely to objectives if adequate profits were to be realized.

Fortunately, several factors helped keep costs down. First, the market was as competitive as it had ever been; the auto indus-

Good buying takes time even when all the conditions are right. Ford purchasing had the time only because it got into the picture months before the model was ever approved and was ready to line up suppliers when management gave the go-ahead on final styling and engineering in March, 1958.

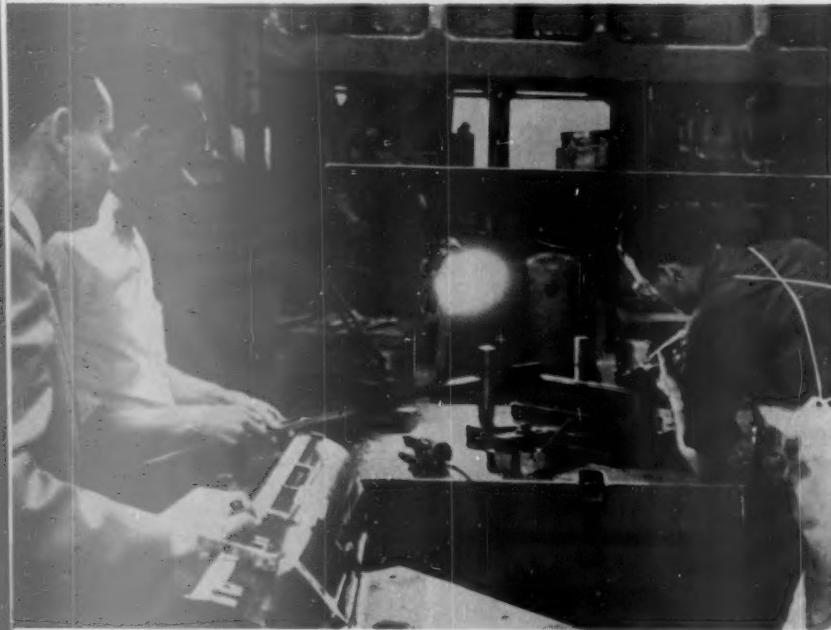
Buyers and purchase analysts immediately started working with engineering on the major functional components (i.e., the non-style items like brakes, steering gear, etc.).

Purchasing moved particularly fast on items where vendors must work closely with Ford engineering on development. For example, Purchasing Agent Larry Hyde began to investigate the type of brakes that would be needed for the Falcon. He knew that the standard Ford car brakes could not be adapted and that new brakes would have to be developed. If he hadn't gotten into the act immediately, engineering would have been forced to pick its own key supplier to develop the brakes.

### Competition Lowers the Cost

Hyde licked the problem engineering's selecting the vendor by having purchasing recommend the developmental source. He got quotes from three established brake suppliers as well as a new supplier for the development work only. He told all his sources that the production business was still open. The vendor who developed the design naturally had some advantage but competitors were not frozen out. Hyde finally wound up splitting the production business between the developmental source and a second firm. Needless to say, the prices Ford pays for brakes reflect the competition of the various suppliers.

Tires are another key component on which vendor engineer-



Tooling was by no means a minor expense on the Falcon. Purchasing estimated and controlled its cost and of course was responsible for procurement and follow-up of progress in tool shops.

were also eagerly pounding on purchasing's door for additional business.

These changing requirements naturally increased the already heavy pressure on purchasing. There was all too little time to do the job. Final details of the Falcon program were approved in March, 1958, only 18 months before model introduction. Normal lead time to get a completely new car into production is about 24 months.

Purchasing was forced to rush

try was operating at less than 50% of capacity during most of 1958. Both Ford plants and outside suppliers were anxious to get Falcon business. In addition, it's almost always easier to buy a brand new part at the purchase analysis price objective than it is to bring a part that is re-worked for a model change into line. With parts for a brand new car, buyers aren't married to a supplier because of existing costly tooling that a competing supplier can't use.

## **How Purchase Analysts Estimate Costs**

PURCHASE PRICE OBJECTIVE															
PART NUMBER <u>BAC-5720938-9A</u>			SHEET <u>1</u> OF <u>1</u>												
DESCRIPTION <u>MLDG - FRONT DOOR a/s R &amp; L</u>															
MODEL USAGE <u>SEB, STA</u>															
1	2	3	PART NUMBER	ITEM	SOURCE	MATERIAL DESCRIPTION	WEIGHT PER UNIT IN POUNDS	COST PER UNIT FOR MATERIAL PER ACU	ADDITIONAL COST OF MANUFACTURE PER ACU	PARTS COST PER ACU	TIMECARD MINUTES PER UNIT	WEEKEND ALLOWANCE	LABOR	BURDEN	NET COST PER ACU
						<u>SAE-F1450</u> <u>GSA 16125N JV-BY</u>	<u>.3470</u>	<u>4486</u>	<u>.126</u>	<u>0080</u>	<u>977.070</u>		<u>0349</u>	<u>0694</u>	<u>2669</u>
FOOTNOTES:											ALLOWANCE FOR BURDEN				
DESCR OF MATERIALS			ROUNDING		COST/ACU						BUDGET TOTAL: BPC: GAC: T				
											101-00000: F01-BMT				
											TOTAL BPC COST				
											FACTORY COST ADJUSTMENT				
											ADJUSTED BPC: GAC: T				
											0.0%				
											TOTAL COST				
											0.0%				
											ESTIMATED SELLING PRICE				
											1 20.2%				
PURCHASE ANALYST <u>L. SWANTON</u>											DATE <u>1-18-86</u>				

Any competent buyer can look at specifications for a new part and come up with a cost estimate that is 90% accurate. He does it by consciously or unconsciously comparing the new item with similar parts he has bought in the past. Ford purchase analysts use this technique too. But they also use far more sophisticated estimating methods that are about 99% accurate in most cases.

Purchase analysts estimate costs with the same basic methods used by competent cost estimators at supplier plants. They precisely compute the rough weight of material needed to make the part by studying the blueprint and allow extra material to accommodate the manufacturing process that will be used.

Then they process the part in detail. They are sufficiently familiar with how the part is made so that they can estimate precisely what equipment will be needed and the rate at which the operations will be performed. From this data, it's easy to calculate direct labor costs by mul-

tiplying the minutes of labor required by the prevailing wage rate. Factory overhead is determined as a multiple of direct labor costs (e.g. 200%); analysts know the overhead rates to use for various types of products and manufacturing operations. The labor and overhead estimates also include allowances for delays, set-up time, scrap, coffee breaks, etc.

To the total factory cost (labor, material, and overhead), analysts add estimated commercial and administrative expense (i.e. the cost of running the front office) and a profit of 10% or more. The total becomes the estimated price. The estimate of a competent analyst is so accurate that suppliers are likely to wonder if he had access to their internal cost data. The analyst with know-how doesn't need such inside information, however. Management confidently bases design decisions upon his estimates and buyers needn't hesitate to use them as tools for negotiation.

ing is extremely important. Since the Falcon would weigh 35% less than the standard Ford, an entirely new tire was necessary. Ford engineers first suggested European sizes, 5:60 x 13, 5:90 x 13, and 6:40 x 13, because they were already available. (American tire companies were making them as replacements for use on imported cars.)

#### **Suggest New Tire Sizes**

Tire suppliers pointed out, however, that these sizes were "old fashioned" because they had a 1:1 section-height ratio. They suggested that new tire sizes be developed with a 0.88:1 ratio. Fortunately, there was sufficient time because purchasing, engineering, and suppliers were able to get started early enough in the program. With the new

"low profile" design, just two sizes are needed instead of three, 6:00 x 13 and 6:50 x 13. The 6:50 x 13 was adopted by Ford's competitors and is used on the Corvair and the Valiant.

If a typical car buyer were to compare a Falcon with a standard Ford, he would agree that the Falcon is smaller and has different styling. But he could never spot the sometimes-brilliant examples of value analysis that permit the Falcon to be sold at such a low price. For example:

The standard Ford has separate garnish moldings (painted steel stampings around each window which are screwed to the inner door panel). In the Falcon, the garnish molding is combined with the inner door panel; this saves over \$1 on each car.

On the Falcon the instrument

panel is welded in; on the standard Ford it's bolted on.

The standard Ford seat track is fastened to a pedestal which fastens directly to the floor; the Falcon track is designed to eliminate the pedestal.

#### **Purchasing Works Informally**

The Ford station wagon has a completely separate floor pan and gas tank; on the Falcon the top part of the gas tank doubles as a section of the floor pan.

Purchasing would hardly attempt to take credit for any of the design features that helped the Falcon cost stay within budget. "We almost never initiate a formal request for an engineering change," explains Purchase Analysis Manager, John Secret. "While we naturally take tremendous pride in seeing our ideas



purchasing helps build the falcon



Purchasing and styling work closely together on trim materials because changes come so frequently and so many varieties are available. Here, reviewing a new

fabric are Purchasing Agent R. F. Moore and Purchase Analysts John Trenary and Al Stout. Good value in fabrics results from this sort of liaison.

incorporated into the final product, we prefer to work informally with stylists, engineers and product planners."

#### **Purchasing Estimates Cost**

On the Falcon, the committee approach proved outstandingly successful on body stampings and ornamental parts. Committee members included both tool cost and piece cost specialists from purchasing in addition to representatives from styling, product engineering, product planning and manufacturing engineering. Each week, the agenda covered various key components. Purchasing provided tooling and piece cost estimates of the latest design idea; the group then discussed ways to do the job better at lower cost.

Only rarely was a design accepted unless many alternates had been considered and rejected. For example, purchase analysis made estimates of 25 different window regulator (the device that raises and lowers the car's windows)

designs. About 70% of the designs were immediately rejected because of high cost; the balance got more detailed consideration. Needless to say, the design actually used in the Falcon represents the best possible value.

Although there were many cases where someone's bright idea brought a tremendous saving, the Falcon cost-control program did not depend entirely on imagination and inspiration. It was methodically organized and budgeted.

Control starts with an IBM run-off of a complete bill of material for a Ford car. Product planners, engineers, and purchase analysts review this bill of material. They cross out all parts they don't think will be needed on the new model and purchase analysts' make crude cost estimates (no drawings of the new model are available at this stage) of parts they think will be required. This estimate, reviewed and refined, becomes the budget that guides

the styling and engineering of the vehicle.

It is broken down into basic elements: engine, body, chassis, ornamentation, etc. As the styling and engineering of the car progresses, the purchase analysts' latest estimates are compared with the budget. If it looks as though the cost of a major component group is going to run over budget, purchasing and the controller's office immediately start waving red flags. Product planning must either cut back spending for some other area of the car or convince a not-too-sympathetic top management that the car should cost more.

#### **Balance Sales Appeal, Cost**

If through value analysis or change in style, one part of the car runs well below budget, product planning may well spend what's saved for some other part. Ornamentation poses a particularly tough problem in car planning. Only so much is allowed for

it in the budget and it's up to the stylists and product planning to decide where \$1 worth of ornamentation will add most to the vehicle's saleability. Design decisions in this area often get reversed. The tastes of the car buying public often change while the vehicle is in development. Fast switches are necessary. On the Falcon, long stainless steel moldings were originally planned along the outside of the car. This idea was dropped but more money was spent on moldings around the windshield and the rear window. The decision represents a balancing of sales appeal with cost.

As the program moves closer and closer to job #1 (i.e. the first car off a regular assembly line), changes become progressively

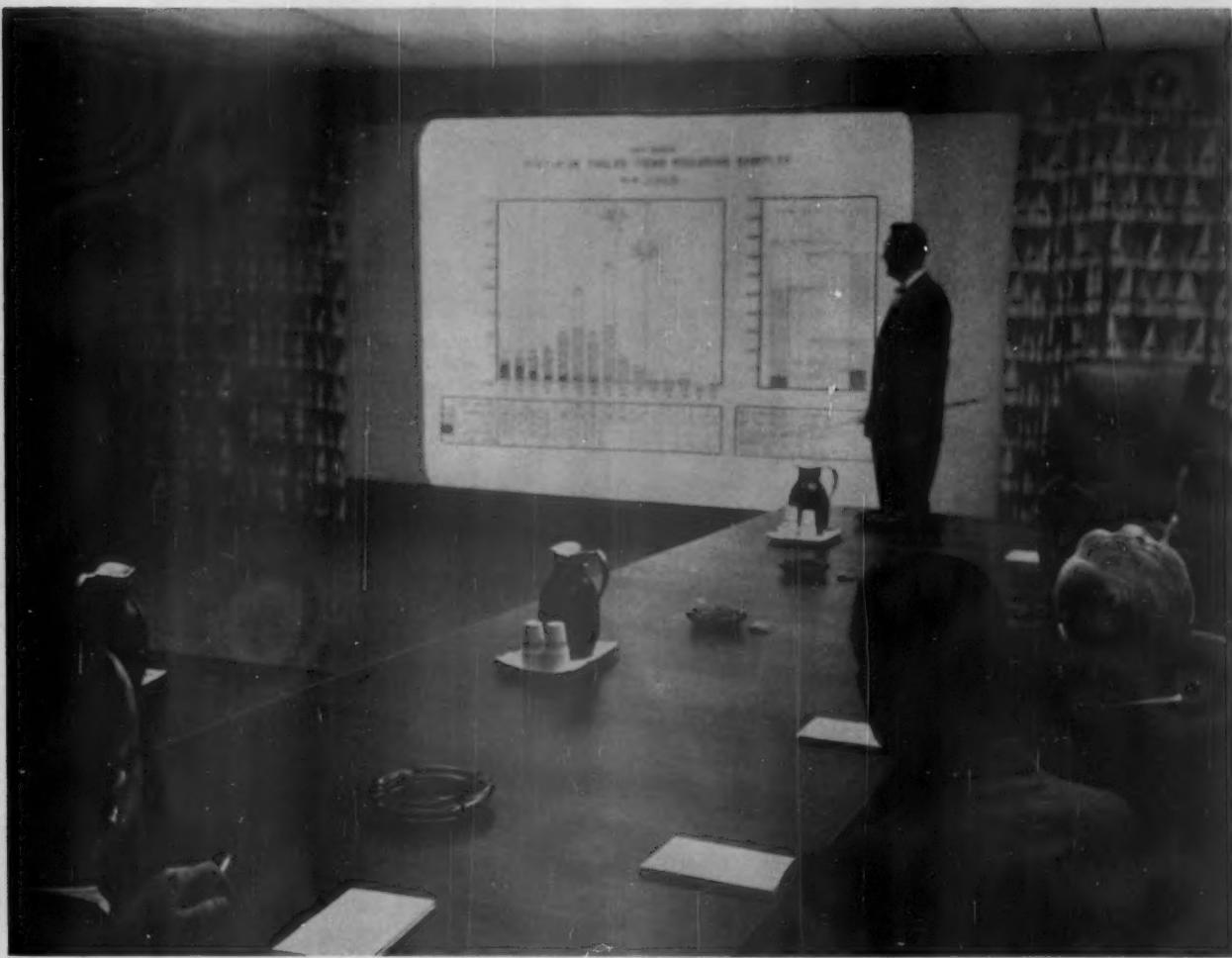
more difficult to make. Finally, for each component (lead times naturally vary), the day comes when purchasing says further changes cannot be made without posing a threat to delivery.

#### Rush Changes to Purchasing

But some changes have to be made anyway. Ford engineers assemble a prototype car as soon as possible for testing; they made the first Falcon prototype in mid-1958. At this early stage all the components are either handmade or lifted from other cars. The Falcon prototype, for example, used a Taunus body. (This gave rise to rumors in 1958 that Ford USA was going to import its new small car from Ford Germany). Engineers use these prototypes to

test the basic mechanism of the car and develop steering, handling, and riding qualities. Any faults revealed by tests are corrected; mandatory design changes are rushed to purchasing.

Purchasing's problems on changes really get difficult when engineering starts testing the first pilot model made from production tools about three months before job #1. This car is identical with the production vehicle in almost every detail. It is assembled from sample parts made from production tools. Inevitably, engineers discover that some components don't fit together as well as they should. Die development on big metal stampings can't be predicted precisely. Changes are most often made on the rubber seals



Getting a new vehicle like the Falcon ready for production is a fantastically complex process. Nothing can be overlooked. Management is kept posted on progress

at weekly meetings. Presentations on timing were delivered regularly by H. W. Foss of the procurement planning department.



purchasing helps build the falcon



Dealers must be ready with tools to service a new car when they get it. Here, reviewing the initial design of a service tool are J. N. Davis of Tru-A Manufacturing

Co., N. L. Dusenberry, tool service engineer, and Buyers G. G. Duncan and C. K. Berg. Tools were ready when the Falcon reached Ford dealers.

or moldings that fit between the sheet metal parts and prevent squeaks and leaks.

While management had naturally been following the progress of the Falcon program from its inception, the prototype stage is especially critical. Prior to this—particularly in the early stages—it is undesirable to be late in releasing a design, placing an order, starting tooling, getting tooling O. K.'d, etc. But, in most cases, the major reason for staying on schedule is basically economic (this is particularly true in the very early stages) since it is often possible to speed up the schedule simply by spending more money for overtime.

In the late stages of the program, this isn't as easy to do. Some jobs take a given length of

time regardless of how many persons are assigned to them or how much money is expended. For example, suppose that through some administrative slip-up (and Ford double-checks everything to avoid such errors) that a buyer forgot to place an order for an item that required tooling (e.g. a hood). If the error weren't discovered until the prototype was built, then the date that production models were built would definitely have to be moved up. Probably no tool shop in the world could construct the necessary dies even if it were working 168 hours a week with unlimited manpower available.

On the Falcon, the crash pad was a problem. It didn't fit properly. This wouldn't have caused any trouble if it had been discovered

on one of the initial prototypes. There would have been more than enough time to rework molds to change the pad's dimensions. But the defect wasn't apparent until the pad was fitted to the pilot car made from production tools.

#### **Didn't Have Enough Time**

Time was short; it was just three months before model introduction. As soon as the defect was discovered, Purchasing Agent Bob Moore contacted the supplier for an estimate of the tooling time that would be required to make the necessary changes in the pad. When allowance was made for the fact that the revised design hadn't even been engineered, it was obvious the part couldn't be reworked by job #1

—even with the supplier working overtime.

The solution to the problem was to start the supplier reworking the tooling before he had complete engineering information available. Engineers made preliminary sketches; then they completed the drawings before the supplier reached the stage where he had to have final information.

These and other minor last minute changes kept the Ford Division purchasing on its toes right up to model introduction time last fall. But finally the Falcon was available on schedule; also available about the same time was Chevrolet's entry in the compact car sweepstakes: the Corvair.

Ford Division purchasing was one of the first Corvair customers. But its purchase wasn't driven more than a few miles; Ford mechanics tore it apart; a team of purchase analysts estimated the cost of every component. In just 72 hours, Ford management had a "quickie" cost estimate of the Corvair; an estimate that analysts discovered was accurate within 1% when they later made a detailed cost study of the Corvair.

This detailed estimate was not made to satisfy a Ford executive's idle curiosity about Corvair cost. It provides vital competitive information. Ford now knows how much pricing latitude Chevrolet has with its Corvair. It can compute the vehicle's profit at existing prices and production volume. It can compare the Corvair's cost with the Falcon's cost: both over-all and component by component.

Is Ford satisfied with the competitive position of the Falcon? General Purchasing Agent Bosworth smiles and doesn't deny that he feels Ford's unique approach to purchasing has done much to strengthen Falcon's competitive position.

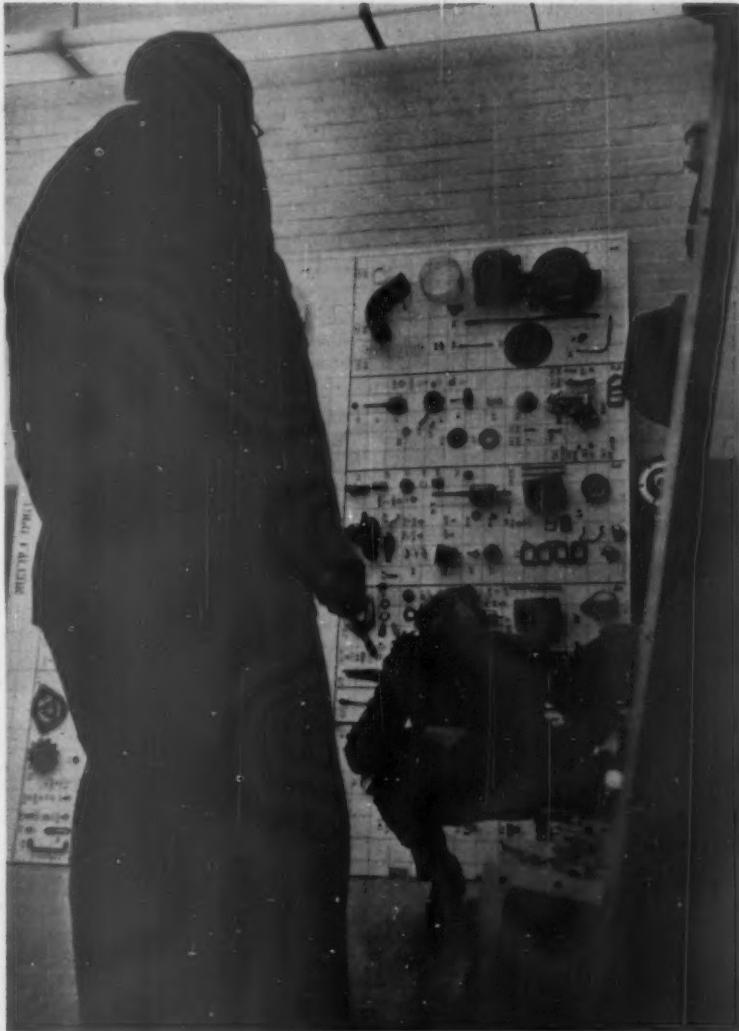
Obviously Ford top management is satisfied too. It continues to rely upon purchasing for cost estimates to guide design decisions on future models. Ford's success on its 1961, 1962, and 1963 models depends partly on the job purchasing is doing now.

## Falcon Gets Latest Design

### Because of Alert Buying



When buyers work with engineering from the very beginning of a new model program, the result is almost always lower cost. The Falcon master brake cylinder is a case in point. An aluminum design, similar to that used on English cars, was originally proposed to reduce costs. But American brake suppliers weren't equipped to manufacture it economically. But Buyer J. C. Hitchcock knew of another low cost design (left side of photo) which was being developed for the standard Ford. He expedited its adoption for the Falcon; otherwise engineering might have been forced to release an older, higher cost design (right side of photo).



One of Chevrolet's first Corvairs was bought by Ford, torn apart, and cost estimated. Studying its engine components here are Buyer Ed Schott and Purchase Analyst G. Hansen.



# Intra-Company Buying Keeps Ford Plants Competitive

FORD Division purchasing is one of management's principal cost control agencies over 28 Ford manufacturing plants employing about 80,000 persons. The Ford Division itself does almost no manufacturing; its basic job is to assemble and sell cars and trucks.

## Purchasing Has Vital Role

But Ford Motor factories do a great deal of manufacturing. They make engines, bodies, transmissions, glass, axles, and other items. All-in-all they account for more than half the value of the parts in a Ford car. Their costs are tightly controlled just as in other well managed plants—with

automation, good supervision, and modern budgetary controls.

Ford top management doesn't feel that these controls are enough, however. Ford plants sell very few products directly to outside suppliers, so their prices, quality, and delivery never get the cold, objective test of the marketplace. They are subject only indirectly to the competitive pressures of the auto business. Ford management believes in competition; it believes companies which have internal competition are more efficient and make bigger profits. So it wants to expose all its manufacturing plants to competitive pricing pressures. Its vehicle for doing

this is the Ford Division purchasing department.

Purchasing tries to treat Ford factories the same way it treats outside suppliers. A sales representative from a Ford manufacturing plant will wait his turn in Ford Division purchasing lobby along with outside suppliers. He must submit formal quotations on new jobs; he gets a Ford Division order if he is awarded the business. Purchasing's price negotiations are just as vigorous with Ford plants than they are with outside suppliers.

Some executives would say that the concept of inter-divisional purchasing is nonsense. After all, how much saving is made if a Ford buyer negotiates a \$1 million cost reduction on a V-8 engine he is buying from the Ford Engine & Foundry Division? The reduction raises Ford Division profits \$1 million and cuts Engine & Foundry Division profits \$1 million. Net change in Ford Motor Company profits: 0.

## But Does It Work?

Does the pressure buyers put on intra-company suppliers really boost efficiency? Do the benefits really more than offset the time and effort spent on the negotiation? Those who don't believe in a competitive economy would say that inter-divisional purchasing is wasteful. Ford management knows better; it knows that only when a division's products are sold at market prices can it know how profitable that division is.



Ford Division not only buys upholstery and trim, it also makes its own trim. Purchasing personnel can readily compare the efficiency of outside suppliers with Ford operations by regular plant visits such as this one by P. J. Rudish, C. W. Eagle, E. A. Bagans, and W. V. Benesh.

And if it can't measure profits, it doesn't know which activities should be dropped or which are so profitable that they should be expanded.

Conventional cost control procedures don't automatically keep a captive plant competitive. The usual procedure is to set transfer prices for its output at cost of production plus some arbitrarily determined profit margin. Budgets are used to control costs. But, unfortunately, they can't control productivity nor do they provide a test of the plant's ability to price in a competitive market. With such an approach, a company can have manufacturing plants producing materials at uneconomic cost for years and thereby drain away profits on the over-all product.

Following company policy, Ford purchasing tries to subject the prices of Ford manufacturing plants to the test of a competitive market whenever possible. When

it is impossible to get competitive bids, the purchase analyst and buyer do the next best thing with detailed analysis and followed by hard negotiation.

On many small parts, it's easy to subject Ford plants to the test of the market. Purchasing invites both inside and outside sources to quote. If a qualified outside supplier is low bidder he gets the job; the Ford plants have to be competitive before they get any business.

#### **How to Find a Price**

Purchasing's approach can't be so direct on major parts where the company may have millions of dollars worth of facilities. But in some cases, it can still get valid market prices. For example, Ford Division buys a major portion of its shock absorbers from the Ford Hardware and Accessories Division and gets the balance from an outside supplier. Purchasing gets the best possible price from the

outside supplier and this automatically becomes the price charged by the Hardware and Accessories Division. With this approach, the Ford plant's prices are identical with efficient outside producers.

It is an easy matter then for Ford top management to determine whether the plant is actually paying its way or not. If a plant doesn't earn the desired return on investment, either its management is at fault or it's a business Ford shouldn't be in. If the plant is earning a return much higher than the company's average, its requests for new capital get rapid approval and purchasing may eventually wind up buying an even greater share of its requirements from the captive plant.

With this approach, Ford would never be so foolish as to go into the textile business (to make upholstery cloth) where returns on investment for the most efficient producers are rarely more than

## **Inter-Divisional Buying Can Bring Direct Savings**

To negotiate effectively on inter-divisional purchases, Ford buyers and purchase analysts regularly visit Ford manufacturing plants. For example, Everett Jones buys heaters from Ford's Hardware and Accessories Division. He reviews analyst's cost estimates to help in negotiation and also visits plants regularly so that he knows exactly how heaters are made. Such visits sometimes bring direct savings. For example, a purchase analyst suggested, after a plant visit, that the Ford engine plant change specifications on the bolts it used. Engineering approved the use of standard bolts to replace expensive patented bolts. Savings are \$196,000 per year.



Jones studies parts of heaters after they are torn down.



He regularly visits Ford heater plant with plant manager and purchase analyst.



## purchasing keeps ford plants competitive

6%. But it has been attracted to the glass business, for example, where the return on investment of efficient producers exceeds 20%.

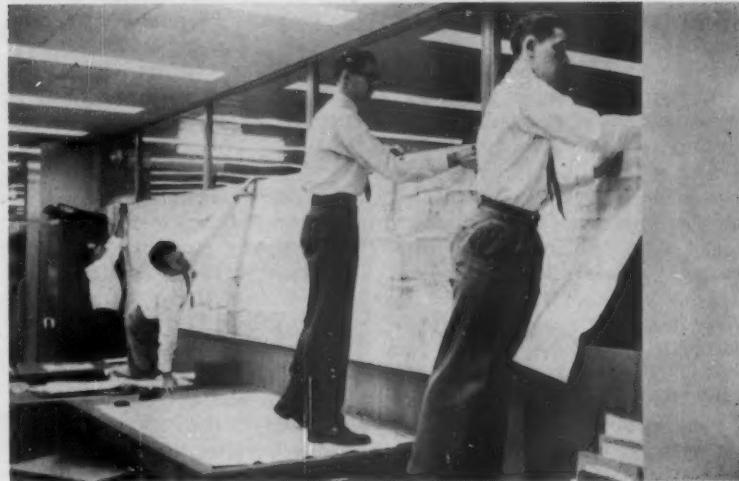
The prices purchasing negotiates with the Ford plants affect their return on investment and this, in turn, influences the company's facility planning. Thus, Ford Division purchasing plays a significant role in shaping the company's make or buy decisions.

Purchasing's big problem in negotiating competitive prices comes on the components for which there is no competition. No independent manufacturer is equipped to produce 10,000 engines daily, so purchasing must have some substitute for outside competition in dealing with the Ford Engine & Foundry Division.

Purchasing is similarly hamstrung even when outside competition is theoretically available. There are, for example, one or two firms that are capable of making passenger car bodies. But the company has no intention of buying bodies on the outside; it has hundreds of millions of dollars invested in automated press shops. Purchasing never asks an outside supplier to quote for the sole purpose of providing a market price to use in inter-divisional negotiations; when Ford suppliers quote, they know they have a chance to get the business.

### Must Use Formula Pricing

Formula pricing is the only answer when there is no outside competition. The purchase analysis department does its best to prevent such prices from becoming "cost plus." It starts estimating key shop parts (along with all other major parts), when the model is first conceived. In many cases, it is estimating costs months before the supplying division is even called on for a quotation. By the time a major assembly is released for production by



Blueprints for the major sheet metal assemblies made in Ford's stamping plants are often quite complex; analysts must check every detail in making their cost estimate.

the manufacturing division, several hundred different cost estimates of its components may have been made. Tooling cost and launching cost (i.e., the extra costs incurred when a new product is first made), are also closely controlled, as is the cost of every engineering change.

When the divisions submit quotations, they're frequently higher than purchasing thinks they should be. Negotiations start. Even though the ground rules are defined—the division's price is supposed to permit a satisfactory return on investment if operation is efficient—the negotiations sometimes get emotional.

In most cases, Ford and the supplying division agree on prices only after they go through detailed analyses step-by-step. Occasionally, the dispute must be arbitrated by the company's central office staff.

Thus, even Ford plants not subject directly to outside competition must fight for profits like outside firms (and like the Ford Division itself, which caters to a not-too-loyal car buying public). In addition to the indirect, long

term benefits of keeping divisions competitive, direct savings often result. Analysts and buyers carefully review all estimates of tools and launching costs. They challenge any expenditures they feel are unnecessary.

For example, a manufacturing division quoted \$23,000 to tool a mounting bracket assembly which will be used on the 1961 Ford car. The quotation was reasonable, in purchasing's opinion, for the manufacturing method that was going to be used. But a purchase analyst pointed out that the part could be made on a multi-slide machine with but \$2,500 worth of tooling and for the same piece price. Ford manufacturing division did not have multi-slide equipment, so the part is now going to be made by an outside specialist supplier and the Ford Motor Company saves \$20,500 in tooling costs.

This saving touched off a number of studies of similar parts which could be made on multi-slide equipment. Several other parts have already been resourced and the savings are multiplying.



## Scientific Buying Techniques Bring Millions in Savings

*A purchasing department that spends billions can save millions. Ford Division purchasing recognizes its opportunities and uses every ethical technique to keep costs down.*

FORD Division's purchasing department is now devoting much of its effort to buying and estimating the cost of components for the 1961, 1962, and 1963 models. But it hasn't forgotten about the 1960 models that are currently its bread and butter. It has a highly organized cost reduction program specially designed to take out as much excess cost as possible from current production vehicles.

The program is based on purchasing's share of the Division's five-year profit plan. Once a year,

purchasing must project the savings it expects to make on each car line five years ahead. This cost reduction budget is not determined in hit-or-miss fashion. Purchase analysis keeps detailed price record cards on all key parts. (See box on page 61 for explanation of key parts concept of control.) It also keeps price data on IBM cards and makes periodic run-offs to compare actual prices with purchase analysis price objectives.

The cumulative difference be-



## purchasing keeps ford plants competitive

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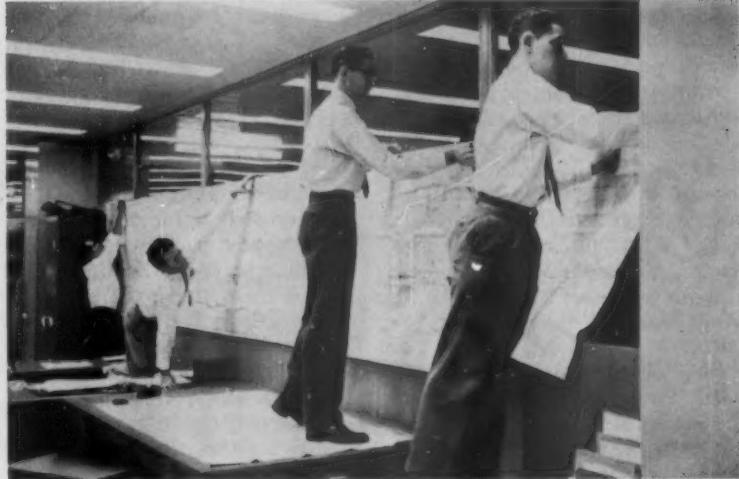
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## how ford saves millions

tween actual prices and cost objectives represents purchasing's basic opportunity for cost reduction. Buyers are expected to work to bring all prices close to the objective. They're also expected, of course, to be constantly working on new materials, more economical processes, etc., which will reduce cost through design change.

### Survey Buying Departments

In making up the profit plan estimate, the purchase analysis department surveys all buying departments to see what they can do. The end result is an over-all profit program for the purchasing department. Progress on this program is one of the criteria by which General Manager Wright measures purchasing's performance.

Each senior buyer gets a part of the profit plan allocated to him (usually on the basis of his dollar volume and the cost reduction potential of the parts he buys); his success in meeting his quota

is one of the criteria by which General Purchasing Agent Bosworth measures his performance.

Price increases arising from higher labor or material costs or engineering changes are not charged against the buyers' quotas. Ford tries to negotiate proper prices when it buys an item initially so suppliers requests for price relief to take care of higher wage or material costs or engineering changes get full consideration.

But woe to the supplier who is too generous in raising prices. With Ford's system, it becomes extremely difficult for a supplier to get a price increase simply to boost his profits. Controls are much too efficient.

Purchase analysis makes a detailed estimate of the cost of each engineering change long before it gets to the buyer. The buyer gets copies of a Parts Change Notice form advising him of the budgeted cost of the change along with blueprints and other engineering in-

formation describing the change.

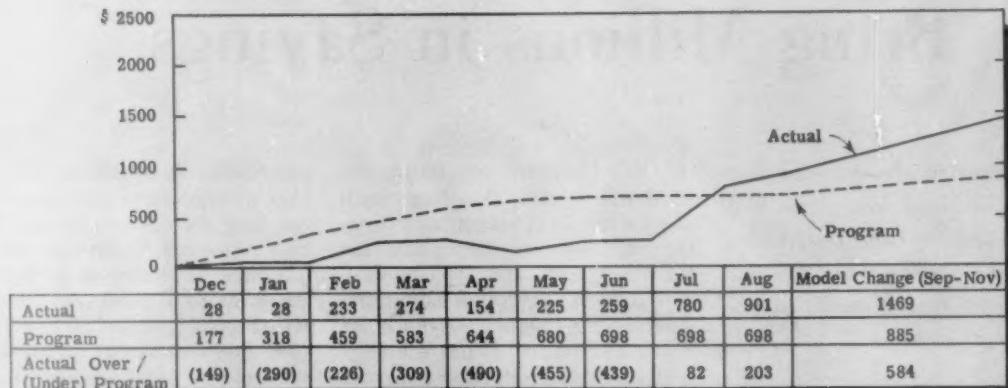
He uses the estimate to help him negotiate and indicates the price change on the Parts Change Notice. If he exceeds the purchase analysis estimate, the difference is noted "negative negotiation" and is debited to the buyer's cost reduction quota. If a buyer succeeds in negotiating a price increase less than that called for in the purchase analysis estimate, the difference is credited to his quota.

### Want Precise Cost Data

If a supplier must pay his workers more or if his material costs rise, Ford will usually compensate him for the increased cost. But it takes a dim view of blanket price adjustments due to "higher wage and material costs." It wants to know the precise cost of the wage increase in cents per hour and insists upon getting the details of all material cost changes.

Purchase analysis reviews all such adjustments. It naturally

Thousands of Dollars at Annual Rate - Cumulative



Purchase analysis plots the progress made by each senior buyer in meeting his quota for negotiated cost reductions. The charts are photographed and made into slides which are shown at staff meetings.



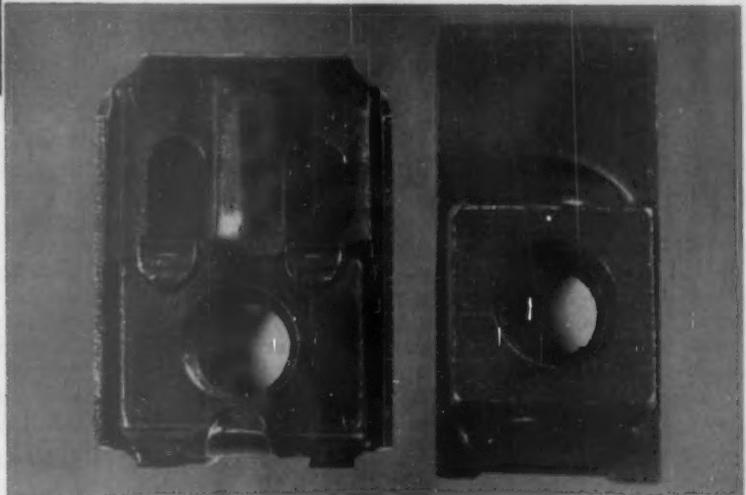
Ford supplier Robert Lamb, of Aetna Products presents his card to the receptionist in the Ford Division purchasing lobby. His arrival time is stamped with the time clock on the receptionist's desk. He won't have to wait long to see someone; if the buyer he wants to talk with is tied up, the senior buyer or someone else in purchasing will see him.

The new design (right) not only requires less material than the old type but also can be made faster.

## Supplier Innovations Big Source of Cost Reductions

Big as Ford is with thousands of engineers and at least one expert in almost any field one could imagine, it is still tremendously dependent upon supplier know-how as a source of new ideas. Many of the features of today's Ford cars can be attributed to suggestions and proposals by Ford's suppliers.

Innovation is possible on even the simplest items—fasteners, for example. Not long ago a new supplier proposed a change in fastener design that is saving Ford \$152,000 per year. His design uses less material; in addition, it can be made on a progressive die punch press at the rate of 220 pieces per minute which is over 50% faster than the old design could be fabricated. Following the lead of the innovator, two other Ford suppliers are now using the new design.



keeps abreast of all materials cost changes and also has a great deal of basic data on labor rates in various areas, typical settlements, etc.

### No Table Pounding

Buyers use purchase analysis estimates of cost changes as their guide in negotiation. If they feel a price should be reduced rather than increased, they can base their negotiation on cost information; they don't just ask for a price reduction because they have a hunch the price is high. As one buyer points out, "Purchase analysis is substituting brains for table pounding in negotiation."

Needless to say, suppliers don't always agree that their prices

should be reduced—even if the buyer's request is backed by highly detailed estimates of cost. They are likely to point out that the estimator's figures are theoretical while their costs are very real. At this stage of the negotiation, the estimator often comes to the buyer's assistance and the supplier's general manager may join the discussion.

Everyone sits down and reviews the cost estimate. Suppliers usually offer their own data if they feel the estimator has been too optimistic on certain operations. They may also invite the estimator to see certain manufacturing operations for himself.

Purchase analysts don't live in ivory towers. Most of them not

only had substantial cost estimating experience before coming to purchasing but they also keep up to date with frequent visits to supplier plants. If the analyst actually sees an operation being performed that he didn't include in his estimate, he is perfectly willing to change his estimate if he is convinced the work is necessary. If it isn't needed, he may suggest processing changes. Or, if some feature of the Ford design is causing the higher cost, he may propose necessary changes.

### No Place for Complacency

Ford purchasing agents try to keep suppliers from getting complacent and inefficient. They carefully review statistics on



## how ford saves millions

quality. They compare what different suppliers are doing on new business; if a supplier is almost always high bidder on new business and the first to try to pass on higher costs, purchasing agents begin to wonder what's wrong with the supplier's management. They also try to keep track of who is first with new developments. As one P.A. observes, "We're paying for part of the supplier's engineering department so we should occasionally get results from it that we can use."

### Spot Lazy Suppliers

Ford P.A.'s consider it a basic part of their jobs to spot suppliers who might be getting lazy and complacent. If this happens, they call in the top managers and warn them that their organizations no longer seem to have the zip they once had; that their costs seem to be creeping up faster than their competitors; that they get poor service either from the district

office or the home office, etc. On the other hand if a supplier is doing a good job, they don't hesitate to tell him about it either. Ford P.A.'s believe that frank appraisals such as this help supplier top management spot problems in their own organizations before either Ford or the supplier gets badly hurt.

Ford purchasing is well informed about many of the most intimate details of their suppliers' business—much better informed than even the more sophisticated suppliers realize. Before a new supplier is approved, buyers and purchase analysts visit his plant and get other data on his qualifications as a potential supplier.

Once a supplier gets an order, Ford maintains more detailed information on his operations. Purchasing will know about his union contract and labor relations; Ford doesn't like to be shut down because of supplier strikes. Ford will also be well informed on the

supplier's costs — even without ever having asked the supplier for any cost data. It will know—by intelligent analysis and comparison of cost data in its files—about what the supplier's manufacturing overhead should be; his ratio of direct labor to indirect labor; his scrap rate, etc. "In many cases," declares Purchase Analysis Manager Secrest, "our approach to costing is as sophisticated as that of our suppliers."

### Buyers Have Ammunition

Thus, buyers have lots of ammunition to use in negotiation when a price is out of line. And purchasing management makes certain that they make use of it. Controls and reports keep everyone in the organization informed of price changes including a price action report, price review meetings, and price performance charts.

**Price Action Report.** Data on every price change on a key part is key punched. Each month, an IBM printer runs off a report of all price changes for the month which shows the part number, part name, the buyer, the cost estimator, the old price, new price, models affected, supplier, and reason for price change. The report is broken down by buyer; copies go to each senior buyer and purchasing agent.

Numerous other price reports are run from the same basic data. The basic breakdown can be by cost estimator, by vendor, by type of part, and by vehicle model. Separate reports are also run on negotiated savings.

**Price Review Meetings.** General Purchasing Agent Bosworth and Purchase Analysis Manager Secrest schedule a price review meeting each month with each purchasing agent. The objective of the meeting is to review price statistics with the P.A. and discuss the progress his department has made and call problems to his at-



Cost reduction is almost always one of the topics on the agenda for General Purchasing Agent Bosworth's weekly staff meetings.

tention. They talk about negotiated savings, potential negative negotiations (price boosts not justified by economic or design changes), intra-company price settlements, potential areas for cost reduction, etc.

**Price Performance Charts.** Purchase analysis keeps track of the progress each senior buyer makes in fulfilling his part of the profit plan. His actual negotiated savings are plotted against his budgeted savings on a chart which is projected at a weekly staff meeting. Buyers not only get to see how well they are doing but can compare their progress relative to other buyers and the entire purchasing office.

Although its program is not controlled in the same way, H. L. Kohlmeier's service parts and accessories buying department has a stiff cost reduction quota and works hard to meet it. This group also coordinates a highly successful cost reduction program at the assembly plant purchasing departments where the equivalent of 23¢ per car was saved last year on MRO items.

#### Watch Tool Costs Closely

While a major part of its efforts are devoted to controlling the piece cost of the parts it buys, Ford purchasing doesn't lose sight of the fact that it spends an average of almost \$100 million per year on the tooling needed to make the parts. Normally, it issues a separate order for tooling to the supplier who makes the part. The supplier, in turn, may either make the tooling in his own shop or subcontract it to independent tool shops.

Obviously, it would be a simple matter for a supplier to offer an extremely attractive piece price if there were no limits on what he could charge for tools. Ford purchasing controls both piece cost and tooling. A separate estimating section in the purchase analysis department is staffed by analysts with years of experience in tooling. Most of them are ex-toolmakers themselves who have also had considerable experience with processing and tool-cost estimating.

If a supplier's tool quotation



Ford offers about 450 trim combinations on its cars. Since it can't predict the sales of each obsolescence loss would be enormous when models change if there weren't extremely close control. Purchasing Trim Coordinator F. E. Nickels carefully reviews complicated raw material schedules to make certain material is available with minimum risk of obsolescence.



Buyers carefully review all engineering changes with suppliers. Here, Senior Buyer G. G. Duncan (center) discusses a circuit revision on the 1960 Falcon radio with his suppliers—O. P. Kusisto, sales manager of Motorola Inc. (left), and L. J. Vanderberg, manager, Radio and Acoustical Dept., Ford Hardware & Accessories Division.

exceeds the purchase analysis estimate by a substantial amount, the buyer and the analyst will review it with him. Sometimes the supplier spots an error in his estimate because it was made too hastily, before he had an opportunity to get detailed estimates.

In some cases when the analyst reviews the supplier's tool-cost

estimate, he spots tooling he thinks can be eliminated through change in design or process. For example, a supplier recently quoted \$136,000 to tool the front bumper guard on the 1961 Thunderbird. This quote was greatly in excess of the amount budgeted to tool the part so it was reviewed in detail. In reviewing the design



## how ford saves millions

of the part, purchase analysts discovered that tool cost was high because of an inner reinforcement which ran the full length of the guard and required complex forming, trimming, and assembly tools. Purchasing recommended that the reinforcement be re-designed. Engineering concurred and created sectional reinforcements which could be tooled for \$27,000 less and which reduced the piece cost by a very significant 27¢ per vehicle.

Analysts can sometimes eliminate duplicate tooling by carefully reviewing each tooling quotation. For example, the upper back finish panel assemblies and the package tray lower panel assemblies for the 1961 Continental and

Thunderbird have identical inner details. The two assemblies are bought by different buyers and, were there no control, could well be bought from different suppliers. Purchase analysis recommended that they be bought from the same supplier to permit common tooling to be used for both assemblies. This cut tool expenditures by \$74,000.

### Save \$500,000

Obsolescence isn't neglected by Ford purchasing either; it's discussed and reviewed frequently at purchasing staff meetings. In the auto business, some obsolescence is almost inevitable at model changeover. Vendors must be scheduled weeks ahead even

though it's virtually impossible to guess precisely how many consumers will want a car with blue upholstery and how many with red. There's bound to be some waste — particularly on trim where purchasing buys about 350 different combinations. But enormous savings are possible with good obsolescence control. For example, Purchasing Agent Bob Moore slashed trim obsolescence in his department by \$500,000 last year. He put one man on obsolescence full time to get tighter control and also started phasing out second sources long before model changeover so he would only have potential obsolescence on an item at one supplier plant.

### PURCHASED PART PRICE OBJECTIVE

#### 14" Air Cleaner & Silencer Ass'y-Dry Type- 8 Cyl.

OBJECTIVE PRICE	\$ 2.5400
CURRENT PRICE	\$ 2.6500 Eff. Job #1, 1957
CURRENT PRICE (OVER) OR UNDER OBJECTIVE	\$ (.11) x S.V. \$ 45,371.92

#### COMMENTS:

Material cost of make parts-steel	\$ .6343
Purchase cost of element ass'y. incl. freight	.4850
Purchase parts cost inc. paint and carton	.2415
Labor cost @ \$.0346/min.	.2488
Burden cost	.5476
Total mf'g. cost-painted and packaged	\$2.1572
Prod. dev. eng'g. @ 3% of mfg. cost	.0647
Adjusted mf'g. cost A & C @ 5%	\$2.2219 .1111
Total cost with A & C	\$2.3330
Profit on element ass'y. @ 5% of total cost	.0262
Profit on remainder of Ass'y. @ 10% of total cost	.1808
Estimated selling price - painted and packaged	\$2.5400

Cost estimates serve as price objectives for buyers on all key parts.

# Sellers' Market for High Potential Purchasing Men

*Ford purchasing wants men who can become top managers.*

*Its program to develop high potential men is unique. Results show up in the unusually fast advancement of purchasing people.*

PURCHASING is not a restricted profession at Ford; it's a job in management. Ford buyers and purchase analysts are all regarded as possible candidates for top management jobs. And many ex-buyers and analysts hold top management positions today. J. O. Wright, Ford Division's general manager, was formerly the division's assistant general purchasing agent and later, the company's director of purchases. His executive assistant, Galen Price, is a former manager of purchasing research. Ex-Ford purchasing executives hold top drawer positions in other companies—in purchasing, sales, and general management.

## Get High Caliber Men

It is no accident that there is high mobility in Ford Division purchasing; it is deliberately planned. General Purchasing Agent Bosworth regards development of personnel as one of the most important phases of his job. His boss, General Manager Jim Wright, is so anxious to see future managers developed in the purchasing department that he demands a semi-annual management development report from every department in the division. Management development is one of the basic criteria used by Wright in evaluating Bosworth as a manager; it is also one of Bosworth's criteria in rating his own managers in purchasing.

Although it has many facets, the Ford approach to management development isn't complex. The main objective is to hire and train a maximum of high potential men. Anyone can become

"high potential" if he has the ability; the only qualification is that the man must be capable of holding better jobs if he is given the proper training.

Some men have higher potentials than others, of course. Those with the highest potentials appear on a special (and highly confidential) organization chart that Purchasing Administration Manager C. T. Stuart keeps for Bosworth. The chart lists potential replacements for every manager in the purchasing department. There are usually several candidates for each position. The incumbent is rated by color code. If a man has green opposite his name, it means his performance is outstanding and that he is a strong candidate for promotion. Other color codes identify men with good performance who will be promotable with additional development.

Every major department at Ford maintains charts like this. Potential successors to an executive need not come from the same department; a manager in Ford Division purchasing could well be promoted (to a better job) in some other department. The charts are extremely useful as tools for planning an orderly succession in the event of retirements, deaths, resignations, or promotions. Even more important, they're devices to remind top management to develop subordinates.

Whenever the chart shows that a candidate for a top job is not fully qualified, his boss must have a program to strengthen him. Similarly, with weaker men, supervisors must indicate to Bosworth their performance up to

standard. Bosworth, in turn, informs General Manager Wright, in his management development report, what he is doing to broaden the skills of the high-potential men.

Ford uses three basic techniques to broaden the skills of its employees: job rotation, special assignments and organized training programs.

**Job Rotation.** A young man hired for Ford Division purchasing can be absolutely certain his first job won't be his last if he has anything at all on the ball. Younger men rarely spend more than a couple of years on one job. Last year, for example, Purchase Analysis Manager John Secrest shifted 14 men to brand new jobs within his department and made a partial change in the assignments of 12 others.

## Job Shifts Are Frequent

Job shifts between departments in purchasing are also not unusual. Frequently, men start in purchase analysis or purchasing administration and then become buyers. High level personnel are also subject to fairly frequent job rotation. For example, Purchasing Agent Larry Hyde has served as assistant purchasing agent in two different buying departments and as manager of purchase analysis. Both Chuck Ewald, manager of procurement planning, and Chuck Stuart, manager of purchasing administration, have had extensive experience on a number of buying jobs.

Job shifts at the top levels are not unusual either. For example, Bosworth was manager of the organization department before



## developing tomorrow's managers

he became, in fairly rapid succession, purchasing agent, assistant general purchasing agent, and general purchasing agent.

**Special Assignments.** Although job rotation is certainly useful, special assignments are perhaps

the most commonly used technique to test the skills of potential managers at Ford. An able and imaginative purchasing executive can devise an amazing number of special assignments to develop his subordinates. Pur-

chasing agents require their buyers to make special studies on new technological developments in their specialties. In doing so, they kill two birds with one stone: they keep themselves informed and they broaden buyers' skills.

Even though they may get in the act on all major sourcing, purchasing agents also insist on specific recommendations from their buyers—supported by facts. Purchasing Agent Hyde goes one step further; he will cross examine a buyer during a sourcing session.

### Get Special Assignments

"A buyer should do more than just get the best possible deal when he buys a malleable casting," Hyde declares. "He should also know why the casting isn't gray iron [which is cheaper], where it's used on the car, and if there isn't some way it can be combined with another part to eliminate it entirely."

**Purchase Analysis Manager**  
Secrest is also a great user of the special assignment—and he usually has more than enough of them. Secrest is called on almost daily for various special studies for Ford Division management. Naturally he delegates as many of these jobs as possible to his staff. Many of Secrest's assignments are extremely interesting since they concern the most intimate details of the company's future product plans.

"In purchase analysis, it is possible for an analyst with little experience to have greater visibility of over-all company plans and organization than he'd get in twenty or thirty years in other departments," he declares. Sometimes the assignments even take his analysts abroad. One of his managers, Art Swift, and Assistant Purchasing Agent J. D. Hutchison recently spent four weeks in Europe visiting Ford plants in England and Germany.



C. T. Stuart, manager of purchasing administration, coordinates college recruitment for Ford Division and also assists General Purchasing Agent Bosworth on other personnel matters.



The procurement planning department is an area where new men get invaluable experience in expediting and timing problems. Both its manager, C. L. Ewald (right) and the supervisor of the timing section, H. W. Foss, have years of experience that belie their youthful appearance.

**Departmental Training Programs.** Departmental training programs are viewed with mixed feelings at Ford. Some P.A.'s feel there is so much variation in the skills of purchasing personnel that any program is bound to be too elementary for one person and too advanced for another person. On-the-job coaching is the best answer, they believe.

Although their shortcomings are recognized, Ford does have about eight formal training sessions each year for male purchasing personnel. Organizing the sessions is, in itself, a "special assignment" given to high potential men. The training committee that does the organizing consists of a chairman from the purchasing administration department and representatives from each of the other departments in the purchasing office. The committee plans the program; members may or may not make the presentation themselves.

#### **Bring in College Grads**

The usual approach is to make a regular written presentation, 25-30 pages long for each session. Everyone gets a copy of the presentation. They are also shown slides of the presentation at the meeting in purchasing's conference room. Topics discussed last year included "Product Development", "Engineering and Releasing for Production," etc. The idea was to better acquaint purchasing personnel with operations directly or indirectly related to their specific jobs and to give them a better picture of over-all Ford operations.

Sessions such as these are particularly useful for new men who know nothing about Ford procedures. Purchasing tries to bring in at least ten college graduates each year. Ford top management encourages college recruitment with its budgetary control practices. A newly hired college grad doesn't count against purchasing's budget during his first six months on the payroll.

Some trainees come to purchasing through the company's over-all recruitment program; others are hired directly by purchasing. Job rotation is usually quite rapid during the man's first



It doesn't take a Ford buyer long to become familiar with a wide variety of manufacturing processes. Frequent plant visits are encouraged. Here, W. Weightman (center), president of Franklin Products Inc., explains problems in tryout of a new bending fixture to buyers J. L. Langdon (left) and J. C. Horrigan.

few years in purchasing. Since merit is by far the most important criterion for promotion, it is not uncommon to find men a couple years out of college making \$600-\$700 per month in Ford purchasing.

Despite the relatively high salaries and opportunities for advancement, Ford purchasing has a tough time recruiting the top calibre college grads it wants. "The young college graduate simply doesn't conceive what a career in purchasing can be like," complains Bosworth. "He doesn't realize the unique opportunities purchasing provides a young man to work with top level executives both in Ford and in suppliers' companies."

Ford purchasing is so eager to get high potential men that it even sends its top executives to college campuses to recruit them.

Coordinating the recruiting program for purchasing is C. T. Stuart, manager of purchasing administration. He works with the company's college recruiting department and also visits college campuses frequently himself to drum up interest in Ford purchasing as a career. Among the schools he has recently vis-

ited are Indiana, Wisconsin, and Illinois.

Last year, Art Swift, manager of the chassis estimating department in purchase analysis, went to M.I.T. "ivory hunting". Purchase Analysis Manager John Secrest gave presentations on purchasing at the Harvard Business School and Purdue Industrial Management School. Jim West visited Northwestern and the University of Michigan for the same purpose.

#### **Rate Personnel Carefully**

Once a man is hired, he can be sure of one thing: management will keep posted on his performance—be it good or bad. All employees have their performance appraised at regular intervals by their supervisors. Members of the management development program get special treatment. Supervisors must make a highly detailed appraisal of them. When there are weaknesses, the supervisors must indicate what they are doing to correct them. They also evaluate the management potential of employees. Job rotation helps eliminate bias of any individual supervisor.

Bigger jobs seem to open up



## developing tomorrow's managers

<b>FORD MOTOR COMPANY</b> Form 3233 Name: _____ Last: _____ Middle: _____ Initial: _____ Department: _____ Position Title: _____ Approved Period: _____ Age: _____ Time on Present Position: _____		<b>MANAGEMENT DEVELOPMENT PROGRAM</b> Date: _____
<p align="center"><b>PERSONNEL APPRAISAL</b></p> <p align="center"><b>PART I—APPRAISAL OF PRESENT POSITION</b></p> <p>1. KNOWLEDGE OF WORK:          Understanding of principles, methods or processes used in assignment.  <input type="checkbox"/> Inadequate    <input type="checkbox"/> Adequate knowledge to perform present assignment    <input type="checkbox"/> Superior knowledge of assignment</p> <p>2. PLANNING AND ORGANIZING:          Development of sound and appropriate plans, and integration of component parts of organization, tools, materials, processes into an effective working unit.  <input type="checkbox"/> Needs some assistance    <input type="checkbox"/> Plans and organizes adequately    <input type="checkbox"/> Superior</p> <p>3. ANALYTICAL ABILITY:          Extent to which facts of a problem or situation are obtained, relationships evaluated and conclusions presented in concise and understandable manner.  <input type="checkbox"/> Has some difficulty    <input type="checkbox"/> Satisfactory analysis    <input type="checkbox"/> Excellent analysis</p> <p>4. JUDGMENT:          The degree to which decisions or actions are based upon discriminating knowledge of values and reached by logical reasoning.  <input type="checkbox"/> Conclusions often faulty    <input type="checkbox"/> Generally sound    <input type="checkbox"/> Outstanding</p> <p>5. MENTAL ALERTNESS:          Ability to interpret and respond to situations, new situations, methods and procedures.  <input type="checkbox"/> Comprehension slow    <input type="checkbox"/> Readily grasps new situations, etc.    <input type="checkbox"/> Exceptional</p> <p>6. INITIATIVE:          Ability to originate or develop constructive ideas and take necessary steps to get things done.  <input type="checkbox"/> Tends to follow    <input type="checkbox"/> Moderate    <input type="checkbox"/> Starts fresh</p>		
<p align="center"><b>PART II—EVALUATION OF POTENTIAL</b></p> <p>a. For what type of assignment and at what level does he appear to be an ultimate prospect (in his present department or other departments or divisions)?          _____          _____          _____</p> <p>b. What type and level of permanent position(s) is recommended as the next step in his development toward the ultimate goal?          _____          _____          _____</p> <p>c. When will he be ready, in terms of training and experience, for "B"?          _____          _____          _____</p> <p>d. When will he be available for (1) training?          (1) advancement          _____          _____</p> <p>e. What special training or experience does he need to reach "B"?</p> <p>f. Do you know of any health or personal considerations that would have an effect on his future development?          _____          _____          _____</p> <p>Concurred in by: _____</p> <p>Date: _____ 19-6</p>		

Both the performance and the potential of all men in Ford Division's management development program are regularly evaluated. Supervisors must fill out these forms which are then filed in the man's personnel folder.

fast for Ford purchasing people. There are plenty of promotions in the purchasing department each year. And there are many Ford purchasing "alumni" working for suppliers and other companies. General Purchasing Agent Bosworth believes a certain amount of turnover is healthy. He likes Ford purchasing to have the reputation of being

a place where a man can better himself—even if this means that many men leave for jobs in other companies. After all, if one hires and develops outstanding men, they're bound to be attractive to and sought after by many other companies.

Certainly if Ford purchasing develops a reputation as a place to work for the man who wants

to get ahead, the result will be that more and more talented men are attracted to Ford. This is exactly what Bosworth wants. His "alumni" in top jobs with other companies will directly or indirectly push Ford as a place to work to any younger men who seek their advice. In the end, Ford purchasing can't help but end up ahead. ► END

# HERE'S! PROOF!

THE GREATEST NAMES IN  
INDUSTRY ARE USING  
ALUMINUM BEARINGS  
IN THE TOUGHEST  
APPLICATIONS

## COMPANIES

Anderson, Inc.  
Bendix Products Div.,  
    Bendix Aviation Corp.  
Boeing Airplane Co.  
Bucyrus Erie Co.  
Caterpillar Tractor Co.  
Clark Bros. Co.  
Clark Equipment Co.  
Clearing, Division of  
    U. S. Industries, Inc.  
Cleveland Crane & Engineering Co.  
Cooper-Bessemer Corp.  
John Deere  
Diamond Alkali Co.  
Fairbanks-Morse Co.

... and there are many, many others!

For information on aluminum bearings see  
your bearing manufacturer, or write Aluminum  
Company of America, 1841-E Alcoa Building,  
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World-wide sales through Alcoa International, Inc.  
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Hardinge Company, Inc.  
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Nordberg Mfg. Co.  
Northern Engineering Co.  
Pesco Div., Borg-Warner  
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## APPLICATIONS for bearings and bushings:

- aircraft landing gear
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- air-conditioning equipment
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- superchargers
- railroad car journals
- compressors
- rolling mills
- combination engines-compressors
- aircraft engines
- aircraft controls
- forming presses
- milling machines
- stationary engines
- automobile engines
- marine engines
- grinding mills



For More Information Write No. 232 on Inquiry Card—Page 34

MAY 23, 1960

**Our fabulous serpentine  
forming facilities  
may save you  
MONEY!**

**TOP REFRIGERATION PEOPLE  
DEPEND ON TOP TUBING PEOPLE**

GM Steel Tubing specialists are ready to help you solve any steel tubing problem. Their proficiency in forming serpentines

is an excellent case in point. Because we have a quantity of multiple benders, we can often adapt one of these instead of starting from scratch. This saves you time and tooling costs.

Remember, too, that rotary-straightening of GM Steel Tubing insures flat-as-a pancake serpentines and this speeds up your wire welding for higher production. These characteristics, plus

GM Steel Tubing standards for quality, strength, cleanliness and on-time delivery have made it tops with refrigeration people.

Write or wire GM Steel Tubing Sales Manager, Rochester Products Division of General Motors, Rochester, New York.

GM Steel Tubing serpentines are "profile" checked for close adherence to your specifications. Dimension, flatness, pressure and cleanliness tests insure the reliability for which GM Steel Tubing is noted.

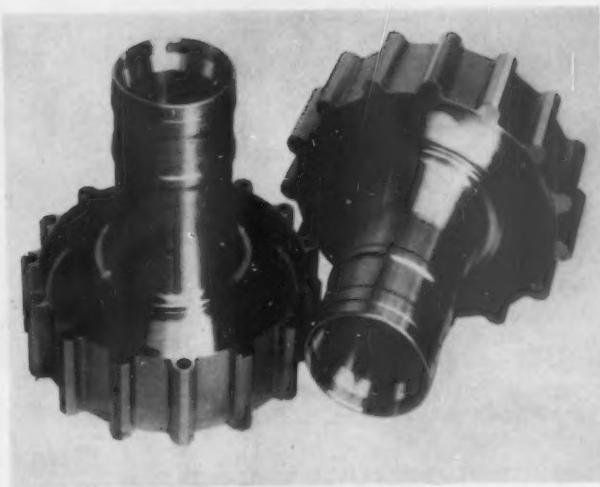


**STEEL TUBING  
BY ROCHESTER PRODUCTS**

**AMERICA'S LARGEST MANUFACTURER OF REFRIGERATION TUBING**



For More Information Write No. 233 on Inquiry Card—Page 34



V

**Component  
Parts**

A



## Component Parts



### Reduces Labor Cost 66% by Switching to Brass Powdered-Metal Part

Newswanger Machine Co., a builder of special machinery, has cut labor costs 66% by using a brass powdered-metal part for its "arrowhead." The part, now furnished by the Reese Metal Products Corp., replaces an aluminum sand casting that required considerable machining to make it conform to specified tolerances and finish.

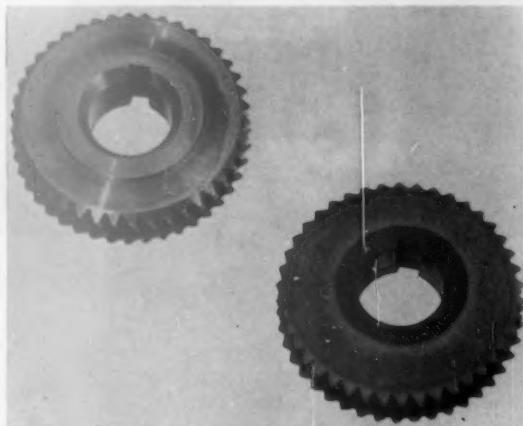
**WRITE NO. 234 ON INQUIRY CARD—PAGE 34**



### Malleable Differential Housing Saves Tooling Costs at Ford

An axle design that capitalizes on malleable iron's ability to be machined and formed economically, contributed important savings to the Ford Falcon. Instead of using the conventional banjo housing, which is an assembly of stampings, Falcon uses a differential carrier in which tubular steel extensions are cold pressed. This design change saved money because it required minimum tooling to start production. By using machine tools which were on hand, Ford reduced capital costs.

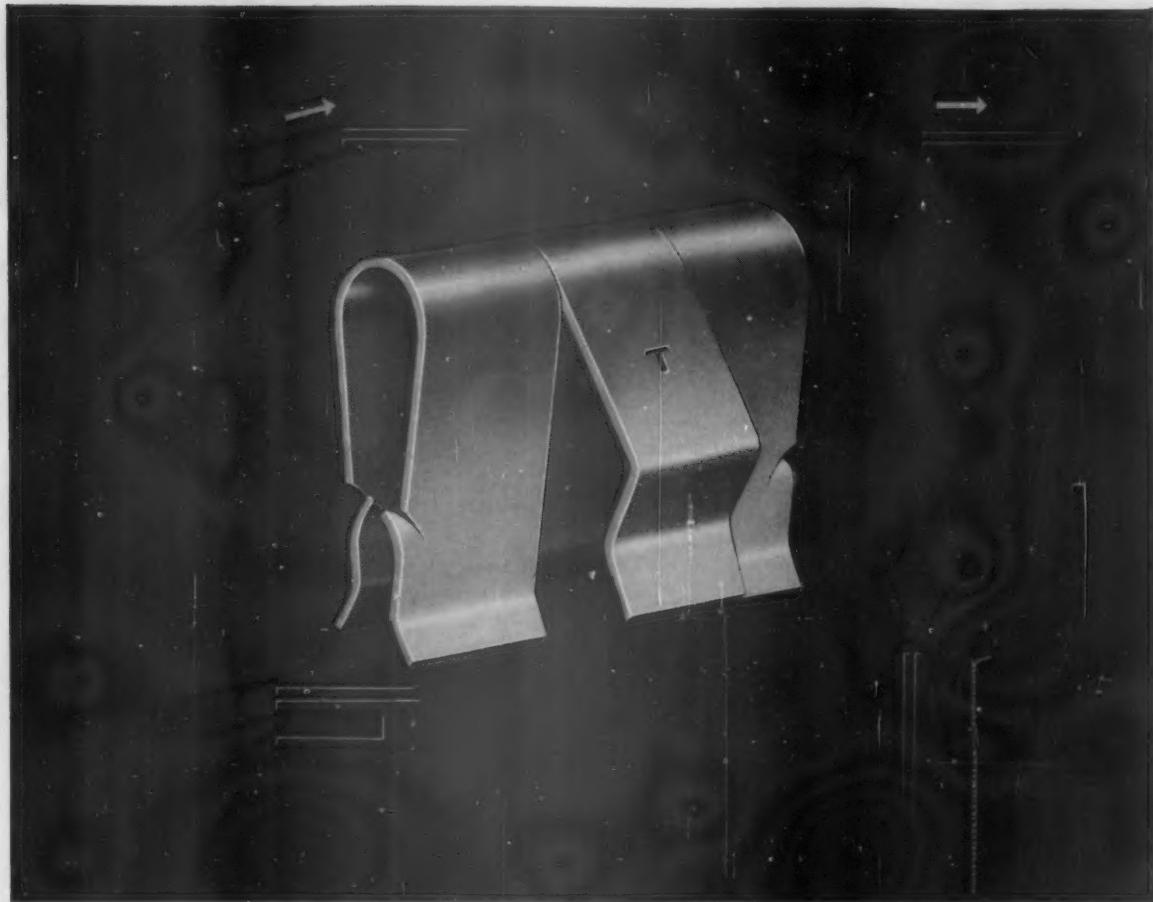
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### Laminated Plastic Gear Is Five Times as Tough as Bronze

In a test by a manufacturer it was found that Spauldite NWFG-802, a grade of laminated plastic made by Spaulding Fibre Co., has five times the wear property of bronze in a gear application. In addition, the laminate gear weighs one-sixth as much as a comparable bronze gear and can be produced for 20% less cost. The laminated plastic also shows excellent fine-machining properties during fabrication.

**WRITE NO. 236 ON INQUIRY CARD—PAGE 34**



Another SPEED NUT brand fastener...

## Just a thumb-push...and steel teeth fasten steel with Tinnerman "U" CLIPS

Twin-action gives this Tinnerman "U" SPEED CLIP® extra holding power in fastening together two sheets of metal, plastic or wood without screws...the heat-treated spring steel tension in the "U" exerts a clamping action...the tiny upset bars bite in and hold on for keeps.

Cost of assembly is substantially reduced when you use Tinnerman "U" Clips for fastening...extra assembly steps are eliminated...no special tools or skills are required...and Tinnerman "U" Clips hold for good!

SPEED NUT Brand "U" Clips are easy to apply...merely thumb-push them over the edges of the panels. A variety of Tinnerman fastener features can also be incorporated with the "U" Clip principle...cable clips, protruding legs to hold glass panels in lighting fixtures, and others.

Call your Tinnerman SPEED NUT representative today...if he's not listed in your "Yellow Pages" Directory under "Fasteners", write direct.

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*Speed Nuts®*



FASTEST THING IN FASTENINGS®

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For More Information Write No. 237 on Inquiry Card—Page 34

MAY 23, 1960

# THE AMPLEXOLOGIST



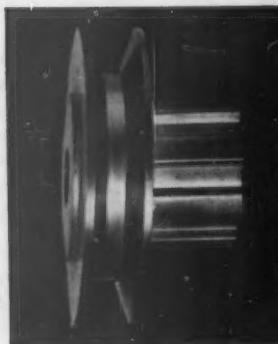


The Amplexologist is not adverse, at times, to using a little hard sell. Especially when he's talking to a hard-headed prospect. Like the manufacturer whose ideas about powder metallurgy seem to be based on information he picked up second hand in, maybe, 1935. The Amplexologist, you see, resents being told—"It won't work, it can't be done"—when he's doing it.

Ergo: Dump a few hard facts in the man's lap.

For example: pulleys, sprockets, cams, gears . . . in dozens of combinations of sizes and shapes. Parts that "couldn't be made" out of powder metal. Parts that Amplex—with new techniques, new alloys, advanced density control—is making today. Take a look!

Well, credit where credit is due. Most manufacturers, we're happy to say, are ready to revise their ideas after the Amplexologist submits the facts. Their openmindedness has saved them thousands of dollars. They like that. We like it, too. It has helped make us the world's largest and most experienced producer of powder metal parts. It's one reason so many manufacturers say: When it comes to powder metallurgy—Amplex has the answer.



**LIKE TO LOOK AT A  
FEW HARD FACTS YOURSELF?**

The part shown is a pulley. Amplex makes it in one piece. A precision part that requires no machining—not even of the V groove. This is one example. The Amplexologist will be happy to load his brief case, come to your office and show you many more. Could open your eyes to the possibilities of advanced powder metallurgy (i.e. Amplexology). Might save you some money, too.

**SEND COUPON . . .** If you'd like to talk over your product with the Amplexologist. Don't hesitate. He's always happy to get out of the office.

**AMPLEX DIVISION • CHRYSLER CORP. • Dept. P5  
P.O. Box 271B • DETROIT 31, MICH.**

Please have the Amplexologist call to look into the possibility of using powder metal parts in our product.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

PRODUCT \_\_\_\_\_

# AMPLEX

DIVISION  
CHRYSLER  
CORP.



For More Information Write No. 238 on Inquiry Card—Page 34



A VIEW OF THE MANY  
DIFFERENT TYPES  
AND SIZES  
OF DANCO MOLDED GEARS

**dependable      [redacted]      molded**  
**nylon gears help measure economy**  
**mileage in new Ford Falcon**

The new compact Ford Falcon has been designed and engineered to give greater driving economy. Accurate mileage readings and "miles per hour" are important to both manufacturer and owner. Helping in this measurement is the Danco "Speedo" gear. This molded gear, located in the transmission, operates the speedometer through the cable assembly.

The "Speedo" gear (used in Ford, Mercury and Lincoln and other automobiles) is just one of more than 20 million gears of all types and sizes that have been molded by The Danielson Manufacturing Company in nylon and other high-performance thermoplastics for hundreds of different applications from delicate instrument movements to heavy-duty drives. Danco gears are proven to outwear steel . . . operate smoothly, noiselessly . . . and cost far less than metal gears in most applications.

Gears are one of the many dependable Danco custom molded and extruded products used in widely diversified fields such as: automotive; marine; business machine; hardware; medical; meter and instrument; textile; conveyor; electronic; bowling; aviation; and chemical.

*For complete information, write today for new, fact-filled brochure.*

**DANCO**

**THE DANIELSON MANUFACTURING COMPANY**  
A Subsidiary of Nicholson File Company  
**DANIELSON, CONNECTICUT**

For More Information Write No. 239 on Inquiry Card—Page 34

PURCHASING

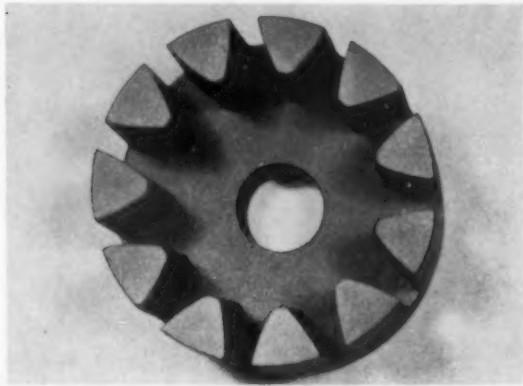
## Component Parts



### Ductile Iron Reduces Cost Of Pump Impellers by 64%

A pump impeller was originally made as a sand cast gray iron part. In order to gain high strength and eliminate much machine work, the foundry decided to produce the part as a shell molded casting in type GS Meehanite ductile iron. Finished, the sand cast part cost \$1.95, whereas the ductile unit cost only \$1.25 to produce. In addition, machining time was reduced by 20%.

WRITE NO. 240 ON INQUIRY CARD—PAGE 34



### Switch to One Piece Casting Results in 75% Cost Reduction

Materials for this barricade bracket cost practically nothing—a few short lengths of pipe and bar stock. But welding the eight pieces into a standard unit cost so much that it more than offset the low material cost. After switching to a pair of uniform malleable castings, the maker saved 75% across the board. The more business-like appearance of the castings was a bonus benefit.

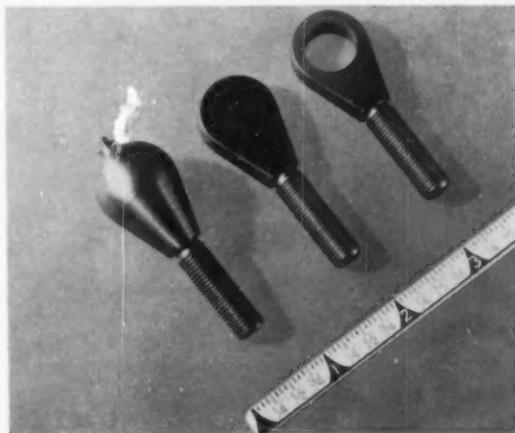
WRITE NO. 241 ON INQUIRY CARD—PAGE 34



### Free-Machining Stainless Steel Cuts Rejects, Boosts Production

The southern precision metal products manufacturer has been able to make a critical missile part more reliable by producing it from a free-machining stainless steel made by Carpenter Steel Co. Previously it had been using a chrome-moly alloy steel. Rejects, which formerly averaged 25% per lot, have been virtually eliminated; production has been increased 80%; several operating steps have been cut out, and overall fabricating costs have been reduced.

WRITE NO. 242 ON INQUIRY CARD—PAGE 34



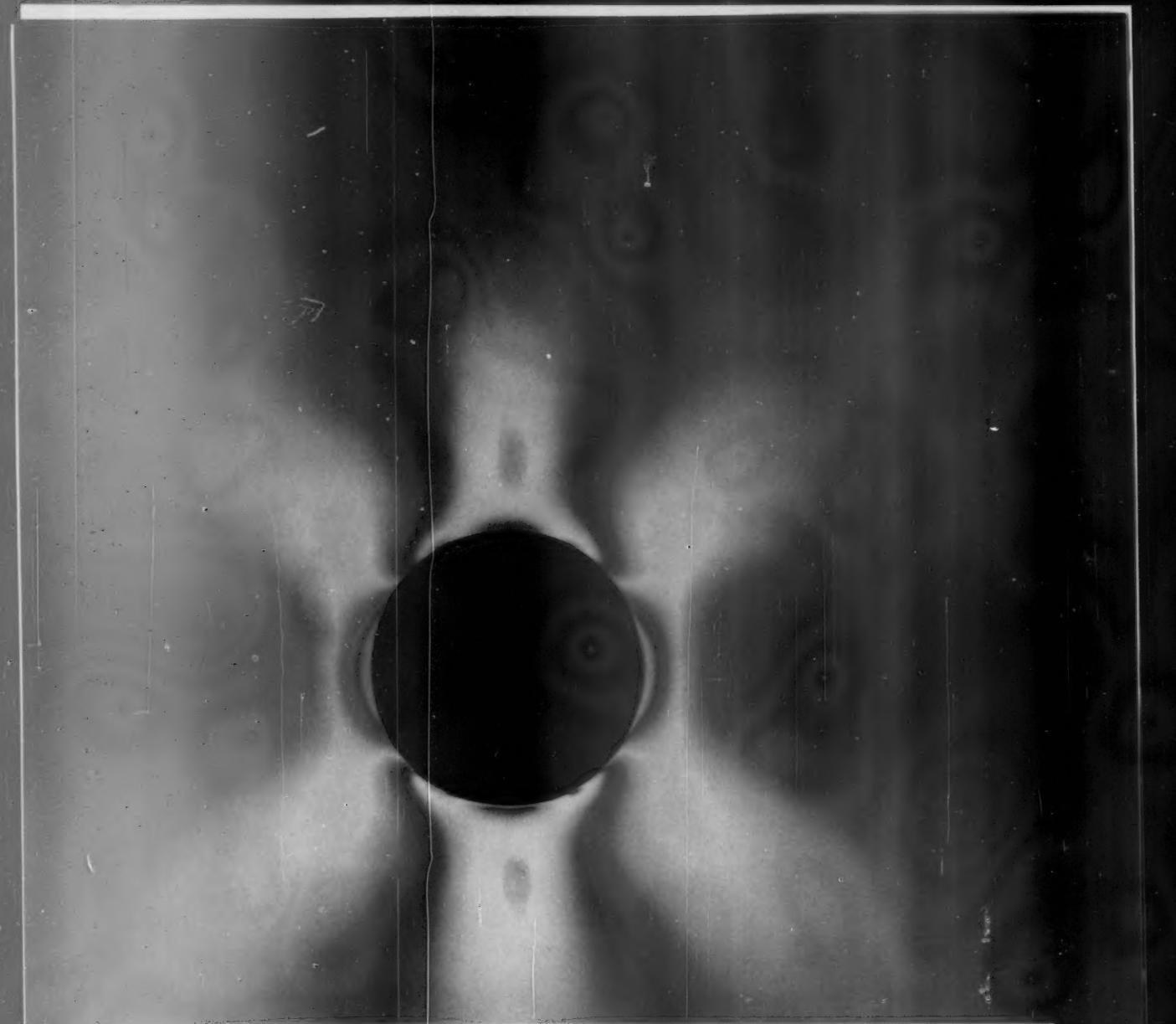


Photo-elastic stress patterns produced by models photographed with polarized light are one of the modern analytic tools available for ever-increasing perfection of Malleable iron castings.

## For Greatest Strength Per Dollar... Use **Malleable**

To improve quality and cut costs, you'll find nothing better than Malleable iron castings. They provide more strength per dollar than any other metal, ferrous or non-ferrous! With Malleable you also get proven toughness, uniform quality and unsurpassed machinability.

See for yourself how much Malleable castings will improve your products and cut your costs. Send

drawings or an outline of your requirements to a nearby Malleable castings producer who displays this symbol—



For detailed information on "Strength Characteristics of Malleable Iron Castings", contact any of the progressive companies listed on the opposite page, or Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

# "Value Analysis" Proves— Malleable Castings Improve Quality, Reduce Costs

When "Value Analysis" is your task, consider these outstanding advantages of Malleable iron castings: more strength per dollar than any other metal, ferrous or non-ferrous; exceptional machinability; metal exactly and only where it is needed; job-proven toughness.

## Switch to Malleable Saves 47% on Railroad Car Thrust Collar

One of countless examples of cost reduction obtained by changing from other materials or processes to Malleable castings is this thrust collar used on railroad maintenance cars. While the steel part formerly used performed satisfactorily, it cost 99¢ before machining.

The cost of the standard Malleable casting before machining is only 51.7¢ — a saving of 47.3¢! Added to this, four machining operations — drilling of bolt hole, spot facing for bolt head and nut, milling the sleeve slot and sawing the transverse slot — were eliminated by switching to a casting. All remaining machining operations are improved due to Malleable's exceptional machinability.



Former part before machining (99¢)



Malleable casting before machining (51.7¢)

## Cost Cut 15% on Spring Bracket by Using Malleable Producer's Engineering Services

This automotive rear spring bracket was originally a steel stamping, S. A. E. 1015, .438 stock, designed to withstand 800 pounds maximum push or pull load on the shock absorber ear. Casting design experience coupled with use of stress analysis techniques by the foundry's designers reduced weight from 4.2 pounds to 2.9 pounds while increasing the part's yield strength to nearly 3,000 pounds. Result: the pearlitic Malleable bracket performed better... cost 15% less!



## Cost-Saving Engineering Assistance Available

The kind of engineering assistance that cut costs and improved product quality for these companies and thousands of others is available to you from any of the progressive producers of Malleable castings that are members of the Malleable Castings Council. Start increasing your product profitability right now — contact any of the companies listed below.

## Free Information Folder

Your copy of an informative folder, *Data Unit 110—Malleable Castings in the Value Analysis Spotlight*, is available free from the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio, or from any member company.



## For Quality and Economy... Use MALLEABLE

### For Service In Your Area Contact...

#### CONNECTICUT

Connecticut Malleable Castings Co., New Haven 6  
Eastern Malleable Iron Co., Naugatuck  
New Haven Malleable Iron Co., New Haven 4

#### DELAWARE

Eastern Malleable Iron Co., Wilmington 99

#### ILLINOIS

Central Fdry. Div., Gen. Motors, Danville  
Chicago Malleable Castings Co., Chicago 43  
Moline Malleable Iron Co., St. Charles  
National Malt. and Steel Castings Co., Cicero 50  
Peoria Malleable Castings Co., Peoria 1  
Wagner Castings Company, Decatur

#### INDIANA

Albion Malleable Iron Company,  
Muncie Division, Muncie  
Link-Belt Company, Indianapolis 6  
National Malt. & Steel Castings Co., Indianapolis 22

#### IOWA

Iowa Malleable Iron Co., Fairfield

#### MASSACHUSETTS

Belcher Malleable Iron Co., Easton

#### MICHIGAN

Albion Malleable Iron Co., Albion  
Auto Specialties Mfg. Co., Saint Joseph  
Cadillac Malleable Iron Co., Cadillac  
Central Fdry. Div., Gen. Motors, Saginaw

#### MINNESOTA

Northern Malleable Iron Co., St. Paul 6

#### MISSISSIPPI

Mississippi Malleable Iron Co., Meridian

#### NEW HAMPSHIRE

Laconia Malleable Iron Co., Laconia

#### NEW YORK

Acme Steel & Malt. Iron Works, Buffalo 7  
Frazer & Jones Company Division  
Oriskany Malleable Iron Co., Inc., Oriskany  
Westmoreland Malt. Iron Co., Westmoreland

#### OHIO

American Malleable Castings Co., Marion  
Central Fdry. Div., Gen. Motors, Defiance  
Dayton Malt. Iron Co., Ironton Div., Ironton

#### MALLEABLE

Dayton Malt. Iron Co., Ohio Malt. Div., Columbus 16  
Maumee Malleable Castings Co., Toledo 5  
National Malt. and Steel Castings Co., Cleveland 6

#### PENNSYLVANIA

Buck Iron Company, Inc., Philadelphia 22  
Erie Malleable Iron Co., Erie  
Lancaster Malleable Castings Co., Lancaster  
Lehigh Foundries Company, Easton  
Meadville Malleable Iron Co., Meadville  
Pennsylvania Malleable Iron Co., Lancaster

#### TEXAS

Texas Foundries, Inc., Lufkin

#### WEST VIRGINIA

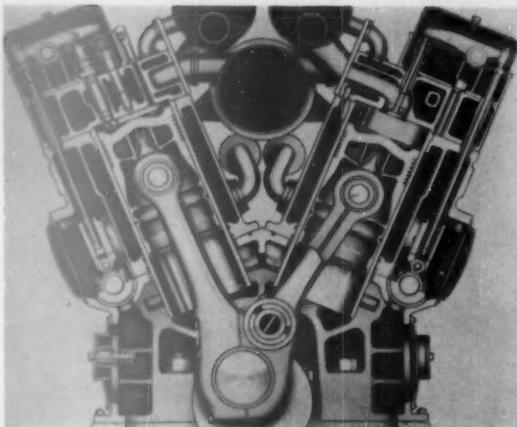
West Virginia Malt. Iron Co., Point Pleasant

#### WISCONSIN

Belo City Malleable Iron Co., Racine  
Chain Belt Company, Milwaukee 1  
Federal Malleable Company, Inc., West Allis 14  
Kirsh Foundry Inc., Beaver Dam  
Lakeside Malleable Castings Co., Racine  
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

For More Information Write No. 243 on Inquiry Card—Page 34

## Component Parts



### Bushing Failure Problem Solved by Using Continuous Cast Bronze

Replacement of sand-cast bronze bushings by continuous cast bronze ended a diesel engine bushing failure problem for the Enterprise Engine and Machinery Co. Tests showed that oil absorption by the porous sand-cast metal was causing the failures. When bushings of Asarco bronze, made by the American Smelting & Refining Co., were substituted, the failures ceased. In addition, there have been no cases of seizure or scoring.

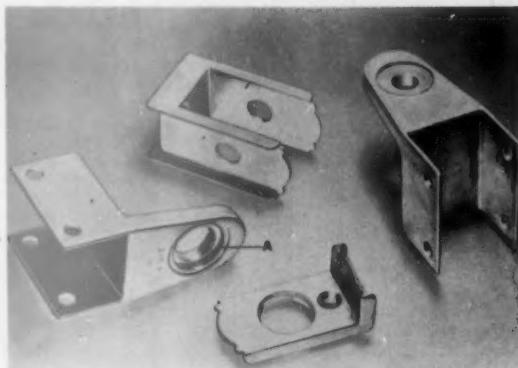
**WRITE NO. 244 ON INQUIRY CARD—PAGE 34**



### Collets Machined From Nylon Rod Cut Ceramic Tube Breakage 80%

Erie Resistor Corp. had been using tool steel collets to hold small ceramic tubes. In processing the tubes nearly 8% broke. Erie decided to use collets made of Nylon 101 rod made by the Polymer Corp., instead of the tool steel. Because of the greater resiliency of the nylon collets breakage was cut to 1%—an 80% reduction. And since nylon machines faster and creates less scrap, the nylon collets ended up costing one-third as much as the tool steel units.

**WRITE NO. 245 ON INQUIRY CARD—PAGE 34**



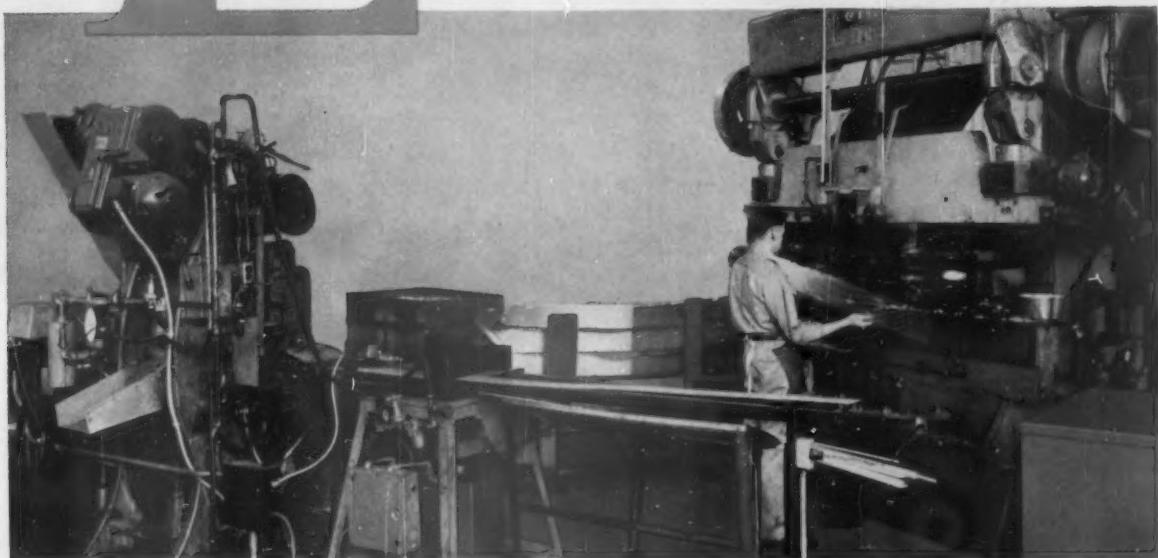
### Save Money on Switch From Brass Stamping to Zinc Diecasting

The components shown here are used as hardware for steel partition doors. They were formerly made as brass stampings. At the suggestion of Monarch Aluminum Mfg. Co., the door manufacturer switched to Zemak 3 zinc and had the components diecast in a four-cavity unit die. As a result the manufacturer is getting his components at considerably lower cost. In addition the zinc units provide the required strength plus a good surface for chrome plating.

**WRITE NO. 246 ON INQUIRY CARD—PAGE 34**

# E

*is for EFFICIENCY  
and  
ECONOMY*



Efficient operation is the straight road to economy.  
And economy in *our* plant cuts *your* cost of production.

E  
.....

At MIRRO, high-speed, automatic equipment lets us turn out *more* work with *less* work—and at a reject rate that's almost disappeared off the bottom of the chart. In the unit above, for example, feed, perforation, and cutoff operations are combined, to supply a single operator with prepared sheet for final forming. This is only one of many machines that make MIRRO a highly efficient and economical source for volume quantities of aluminum components.

Phone, wire, or write for more information about how we can help you do *your* job better, for less.



MIRRO ALUMINUM COMPANY • MANITOWOC, WISCONSIN • Fifth Avenue Bldg., New York 10 • Merchandise Mart, Chicago 54

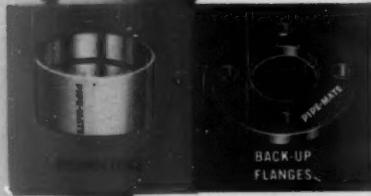
For More Information Write No. 247 on Inquiry Card—Page 34

# NEW...FROM TUBE

## FROM YOUR TUBE TURNS' DISTRIBUTOR

The complete line of PIPE-MATE® Fit-tings, Flanges and Accessories are available from your nearby Tube Turns' Distributor. For pipe sizes  $\frac{1}{2}$ " to 4"... Schedules 5S and 10S... in Types 304L, 316 and 316L.

PIPE-MATE®



180° RETURNS



PIPE-CAPS



TEES



STUB ENDS



CONCENTRIC REDUCERS



ROTATING  
INSERT FLANGES



90° ELBOWS



45° ELBOWS

# URNS...

## PIPE-MATE light-wall stainless steel fittings and flanges

Tube Turns introduces another important key to lower piping costs... a new line of light-wall stainless steel fittings and flanges for process piping. Here's how this PIPE-MATE\* line reduces costs...

**Cuts material costs.** Compared to standard weight Schedule 40S pipe, *light-wall* piping in Schedule 5S or 10S cuts material costs as much as 30% to 50%. It weighs  $\frac{1}{2}$  to  $\frac{1}{3}$  as much, is easier to handle, easier to install and provides greater flow area.

**Simplifies installation.** Extra long tangents of PIPE-MATE fittings provide full straight-line clearance for fitting-to-fitting connections and permit fabrication of completely flanged elbows, returns, tees, etc. Aligning connector speeds making of socket type joints. Fittings may be butt-welded, fillet-welded, brazed or soldered, or joined by rolled-in flange connections.

Here is another plus value you get when you specify products of Tube Turns and buy them from your Tube Turns' Distributor.

**FREE BULLETIN** on PIPE-MATE Fittings and Flanges describes complete line, shows installation procedures, and gives properties and dimensional tolerances. Mail coupon for copy.

\*"PIPE-MATE" and "tt" are trademarks of Tube Turns.

Another **tt** plus value from...

## TUBE TURNS

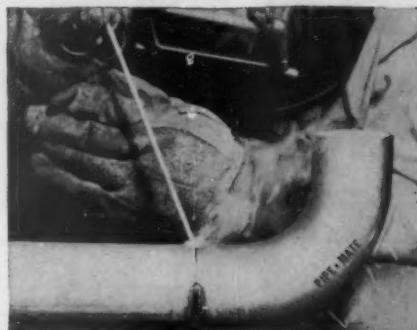
DIVISION OF CHEMETRON CORPORATION

Louisville 1, Kentucky



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FOR  
BUTT-WELDING



FOR  
FILLET-WELDING,  
BRAZING OR  
SOLDERING



FOR ROLLED-IN  
FLANGED JOINTS

**TUBE TURNS**  
Department PM-5, 224 East Broadway  
Louisville 1, Kentucky

Please send bulletin TT944AR.

Company Name \_\_\_\_\_

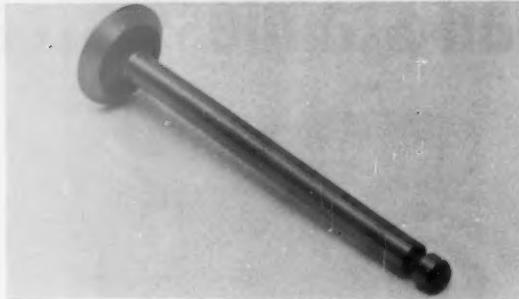
Company Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Your Name \_\_\_\_\_

Position \_\_\_\_\_

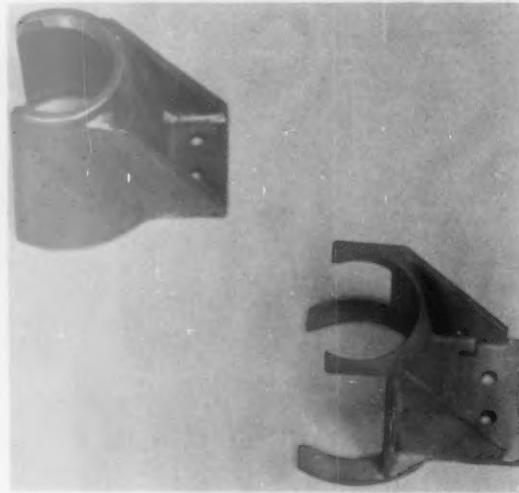
## Component Parts



### Valve Cost Lowered 10% by Change From Forging to Cold Heading

National Lock Co. reduced the unit cost of manufacturing gasoline engine intake valves 10% by cold heading, instead of forging them. The customer who benefited from the cost reduction is a leading lawn mower manufacturer. National Lock made the change after testing alloy metals for required strength. The lawn mower manufacturer reports the cold headed valve is more durable than the forged unit.

WRITE NO. 249 ON INQUIRY CARD—PAGE 34



### Investment Casting Improves Design; Saves Dollars, Pounds

The lamp division of the Westinghouse Electric Corp. uses over 200 investment castings to solve design problems, improve quality, reduce cost. Bulb holder was previously supplied as machined sand casting. When an investment casting was developed with the help of the Engineered Precision Casting Co., cost was reduced 50%, weight cut one-third.

WRITE NO. 250 ON INQUIRY CARD—PAGE 34



### Special Zinc-Coated Steel Cuts Costs, Speeds Assembly

Brady Air Controls, Inc., reports production savings and improved performance since it replaced diecastings with Armco Zincgrip steel for valves on its water pressure tanks and controls. Originally the company's valves were two cup-shaped diecastings joined by bolts with a diaphragm in between. Now the valves are formed from zinc-coated steel with the diaphragm inserted. Both parts are then locked together by a reverse draw that creates an air-tight seal. The new material is said to cost less and assemble faster.

WRITE NO. 251 ON INQUIRY CARD—PAGE 34

# Save Dollars By Using Johnson Bronze Standard Stock Bearings

Do you like to pay the added cost for special bearings? Of course not. It doesn't make sense.

But using *low-cost* Johnson Bronze standard stock bearings does make sense—especially when you consider that these bearings will meet your tolerance requirements and allow maximum freedom of design. Johnson standard stock bearings have the quality of special bearings, but the tooling and machining costs are eliminated. You profit from the savings.

Due to increased demand, bigger stocks of these Johnson bearings are available from warehouses and distributors across the country.

More than 900 stock sizes of these plain, whole bearings in 214 different ID-OD combinations and 21 lengths are yours to choose from. They can be supplied also with slots, oil grooves or holes at slight additional cost.

Save money . . . save time with Johnson standard stock bearings. *They make sense.* Get in touch with your Johnson distributor today for fast service.

See how much can be saved on a typical special order by using Johnson Bronze Standard Stock Bearings

	10 BEARINGS $\frac{1}{2}$ " x 1" x $1\frac{1}{2}$ "	
	SPECIAL BEARINGS	JOHNSON STANDARDS
PATTERN COST	\$	NONE
CASTING COST	\$	NONE
TOOLING COST	\$	NONE
MACHINING COST	\$	NONE*
SCRAP LOSS	\$	NONE
TOTAL COST	\$	\$12.70
DELIVERY DATE	#	IMMEDIATE

\*Possibly slight alteration for oil grooves, holes



## Johnson Bronze

450 South Mill Street • New Castle, Pa.

Subsidiary: Apex Bronze Foundry Co., Oakland, Cal.



GRAPHITED  
over 175 sizes



STANDARD STOCK  
over 900 sizes



UNIVERSAL BRONZE BARS  
over 400 sizes



POWDER METALLURGY  
over 400 sizes



ELECTRIC MOTOR  
over 350 sizes

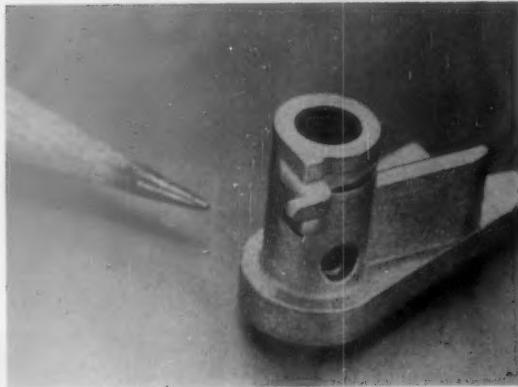
JOHNSON  
Bearings



For More Information Write No. 252 on Inquiry Card—Page 34



## Component Parts



### Minicast Process Makes It Possible To Make Complex Part as One Unit

The component shown here is used in an automatic coin changing mechanism on a vending machine. Originally it consisted of a series of separate stampings and other fabrications that were brazed together. The vending machine manufacturer called on Casting Engineers to see if the part could be made any more efficiently. As a result, the part is now being produced as a single unit by the Minicast process. Multiple production and assembly operations have been eliminated and the part is stronger.

WRITE NO. 253 ON INQUIRY CARD—PAGE 34



### Welded Construction Permits 40% Reduction in Machine Time

Redesign from casting to weldment reduced machining time 40% on a fabricated rope hoist drum used for moving railroad cars. Smaller parts were pre-machined prior to welding them into finished assembly. Sanford Day Iron Works, Knoxville, Tenn., found that reduction in size and weight and elimination of access restrictions simplified both handling and fixturing, and reduced set-up time.

WRITE NO. 254 ON INQUIRY CARD—PAGE 34



### Production Upped 400% Between Die Redressings

Excessive tool wear and close tolerance requirements were limiting a business machine manufacturer's production of calculator clutches. When the company switched to Carpenter Steel Co.'s No. 610 tool steel, which has consistent centerline quality, it was able to turn out 30,000 pieces on the first run of the shaving die and 45,000 pieces were produced on the first redressing without any burrs appearing on the part. The blanking die has not been touched since the changeover.

WRITE NO. 255 ON INQUIRY CARD—PAGE 34



Take a cost-wise look at your assembly operations,



and you'll see that fasteners



represent real money. To make sure



it is money saved—not lost—



count on *Continental*

**MORE TYPES OF FASTENERS** Continental Assembly Specialists are unbiased toward any particular types . . . Continental makes all types. The fastener they recommend for your job is the one proved best by careful cost analysis.

**MORE STANDARDS IN STOCK** Continental can supply any recognized standard type, style or size. Also, many fasteners ordinarily considered "specials" are available among the millions of screws constantly in stock to meet needs of Continental customers.

**MORE "SPECIAL" EXPERIENCE** Continental is known throughout industry as the "specialist in specials," — leads in production of special designs. Continental is also your supply

source for special-purpose fasteners, such as HOLTITE NYLOK Self-locking Screws.

**MORE "SPECIAL" PRODUCTION FACILITIES** With Continental's modern, precision controlled equipment, many special shaped screws formerly machined from bar stock can be produced faster, at lower cost — with higher tensile strength and excellent surface quality.

Let Continental Assembly Specialists analyze your operations and help you find cost-saving opportunities that are often overlooked. You'll see why fastener users everywhere agree, "You can count on Continental." Write or phone: Continental Screw Co., 457 Mt. Pleasant St., New Bedford, Massachusetts.

## CONTINENTAL SCREW COMPANY

### HOLTITE FASTENERS

HOLTITE PHILLIPS AND SLOTTED HEAD  
WOOD • MACHINE • TAPPING • THREAD CUTTING • SEMS • NYLOK  
HY-PRO PHILLIPS INSERT BITS AND HOLDERS

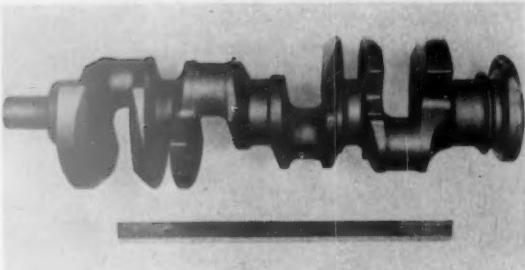
HY-PRO TOOL COMPANY Division RESEARCH ENG. & MFG. INC. Subsidiary

For More Information Write No. 1 on Inquiry Card—Page 34

MAY 23, 1960



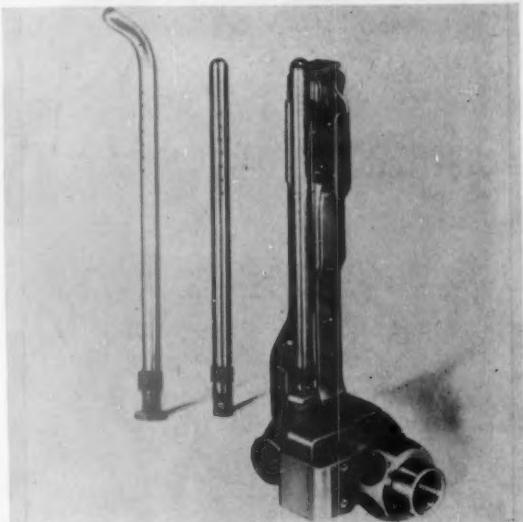
## Component Parts



### Tool Life Doubled When Malleable Crankshaft Replaces Forging

The simplified and shorter machining cycle for this pearlitic malleable crankshaft caused it to be selected over a forging for one auto model. GM's Central Foundry Division reports these benefits: 100% increase in tool life, 33 to 50% reduction in machining time, use of only six types of carbide tools instead of 25, less stock removal, and a substantial reduction in the number of machine tools required.

WRITE NO. 2 ON INQUIRY CARD—PAGE 34



### Switch to Welded Tubing Cuts Cost 18%

Kilroy Controls, Inc. cut material costs for its hot water automatic pilots 18% by switching from type 304 seamless tubing to welded stainless tubing of the same analysis. The change to the lower cost welded tubing was made without reducing the effectiveness of the tube or impairing workability. Kilroy Controls is making additional savings by ordering the tube in random lengths from five to 22 feet.

WRITE NO. 3 ON INQUIRY CARD—PAGE 34

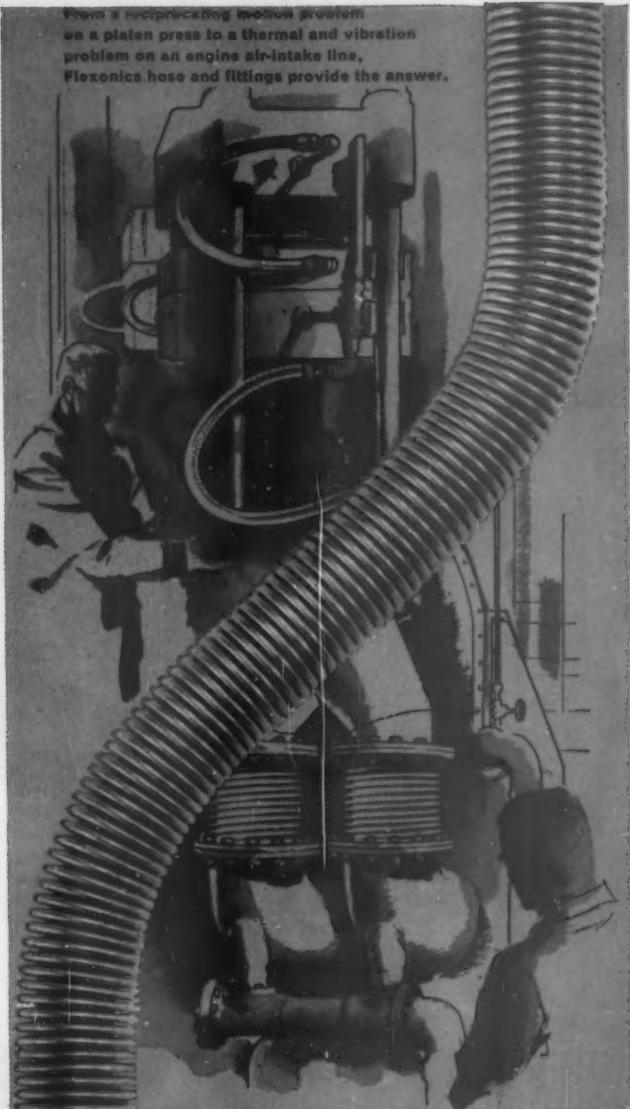


### Copper Impact Extrusion Saves Machining and Scrap Costs

The cup of this Fulton Sylphon automotive thermostat was originally machined from free cutting copper rod, a costly method which also had a high scrap rate. Tests by Revere Copper & Brass, Inc. determined that the part could be impact extruded from copper rod and still meet exacting hardness specifications. Machining was eliminated and scrap rate was cut to almost zero.

WRITE NO. 4 ON INQUIRY CARD—PAGE 34

When a reciprocating medium problem  
on a platen press is a thermal and vibration  
problem on an engine air-intake line,  
Flexonics hose and fittings provide the answer.



*your most experienced source*

# for METAL HOSE

**to control the effects of  
pressure, temperature and  
motion in the conveying  
of any medium**

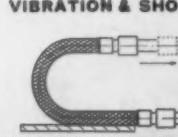
YOUR DESIGN REQUIREMENTS for metal hose are greatly simplified by the unparalleled Flexonics experience. The most challenging problems are often solved by Flexonics broad standard line of hose and fittings. It's simply a matter of time and talent! Flexonics has been in the business longer, and has the most talented product engineers, metallurgists and application engineers in the business. The result is rapid and right answers to any design application of metal hose.

THE MAJORITY OF PIPING PROBLEMS result in, or are associated with one of the pipe motion problems shown in the illustrations below. Your Flexonics sales engineer is a trained Pipe Motion Specialist, capable of anticipating and providing for any problems relative to your specific design requirements.

PIPING MISALIGNMENT



VIBRATION & SHOCK



THERMAL EXPANSION & CONTRACTION



RANDOM MOTIONS

RECIPROCATING MOTIONS

CONFINED PIPING SPACE



## Flexonics corporation

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ont.



EXPANSION  
JOINTS



METAL  
HOSE



SYNTHETIC  
HOSE



BELLOWS



AERO/SPACE  
COMPONENTS

SUBSIDIARY OF CALUMET & HECLA, INC.

For More Information Write No. 5 on Inquiry Card—Page 34

ATTACH TO YOUR LETTERHEAD—MAIL TODAY!  
**FLEXONICS CORPORATION**

1316 South Third Avenue  
Maywood, Illinois

Please send me  
my personal copy of  
the Flexonics Metal Hose and  
Fittings Design Guide, covering in detail  
Flexonics products and services.



IH-265



## ANNOUNCING A NEW CORPORATE NAME for The Garlock Packing Company



**Garlock Inc. becomes the new name for The Garlock Packing Company, Palmyra, N. Y., to reflect more accurately its broad diversification of products and markets.**

Originally established to manufacture mechanical packings, Garlock now produces over 2,000 different styles of packings, gaskets, seals, molded and extruded rubber and plastic products for every major industry.

The new corporate name, Garlock Inc., more closely identifies this 73-year-old company with the growth and development of its product lines. Today, industry goes to Garlock for such widely diversified products as:

- Hydraulic-Pneumatic Packings
- Oil and Grease Seals
- Gasketing and Expansion Joints
- Braided Packings
- Molded and Extruded Rubber Parts
- Plastic Stock Shapes and Fabricated Parts
- Mechanical Seals for Rotating Shafts
- Metal Packings
- Leather Packings
- Electronic Components
- Dry Bearing Materials
- Fluorocarbon Tank Linings
- Missile and Rocket Components

To help you in selecting or applying these products, Garlock offers the services of over 126 thoroughly-trained sales engineers, 175 electronic component manufacturers' representatives, 180 authorized bearing distributors and 69 foreign distributors. Conveniently located warehouses and stocking points assure Garlock customers of prompt delivery.

At Garlock Inc., design and development of new or improved products and materials is an ever-present objective. To this end Garlock maintains extensive research and laboratory-test facilities. In addition, Garlock engineers and chemists are always ready to work with you in seeking solutions to tough application problems.

# G A R L O C K

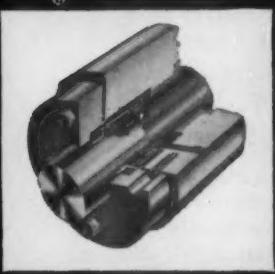
To find out more about "the new Garlock," call the nearest of our 26 sales offices, or write to Garlock Inc., Palmyra, N. Y. To assure prompt attention, please refer to Garlock Inc. on all future correspondence and orders.

**Canadian Div.: Garlock of Canada Ltd.**

**Order from the Garlock 2,000 . . . two thousand different styles of Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Products.**



Plastic Stock Shapes  
and Fabricated Parts



Mechanical Shaft Seals



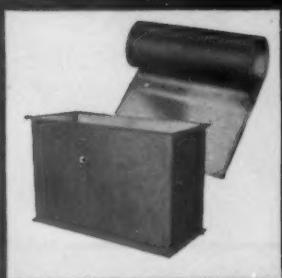
Gasketing



Hydraulic-Pneumatic Packings



Expansion Joints



Fluorocarbon Tank Linings



Molded and Extruded Rubber Parts



Oil and Grease Seals



Metal Packings



Spiral Wound Gaskets



Dry Bearing Material

**I N C.**



Missile and Rocket Components



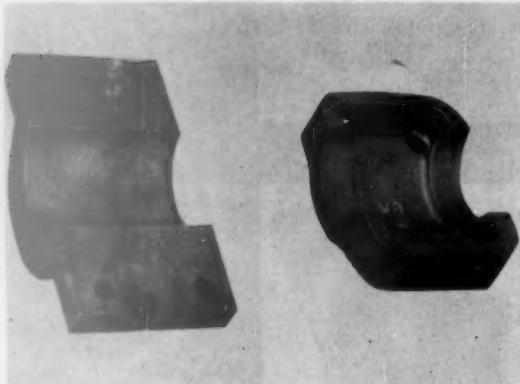
Leather Packings



Electronic Components

**V**  
VALUE ANALYSIS  
**A**

## Component Parts



### Redesign in High-Strength Iron Solves Breakage Problem

This part was converted from a gray iron casting to solve a breakage problem encountered during assembly and field use. The Northern Malleable Iron Co. redesigned the part in high-strength malleable iron to attain the ductility needed for the application. The original cap weighed almost nine pounds and cost \$1.50. In malleable, it weighed 5½ pounds and cost 88¢. More important, the failures stopped.

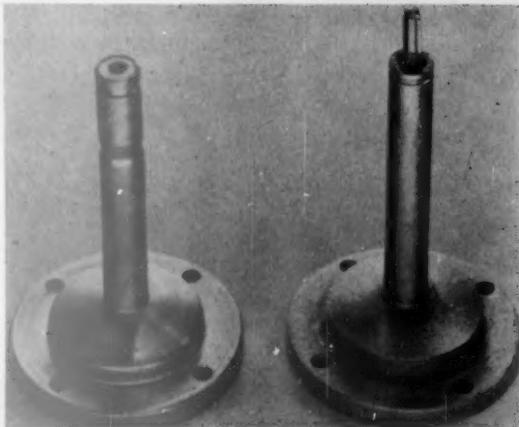
WRITE NO. 7 ON INQUIRY CARD—PAGE 34



### Redesign Substitutes One-Piece Laminate for 8-Piece Assembly

The U-C Lite Manufacturing Co., Chicago, is now making beacon lamp terminal plates of one-piece copper-clad phenolic laminate, saving five cents in labor on each lamp. This represents a pioneering electrical use of material originally developed for printed circuits. Formerly terminal plates were made of eight pieces. Copper clad laminate, furnished by the National Vulcanized Fibre Co., also eliminates a riveting operation.

WRITE NO. 8 ON INQUIRY CARD—PAGE 34



### Producing Valve as a Forging Slashes Cost 20%

Eclipse Fuel & Engineering Co. is now saving 20% on the overall cost of D.O. valves. Originally these valves were made from a cast base and screw machine shaft that were brazed together (right). There were frequent rejects because of porosity in the base or because the shaft was not brazed on straight. Eclipse then had the Cored Forging Div. of Bridgeport Brass Co. make the parts as a one-piece forging. With the valves being produced as forgings, rejects were reduced and machining time was cut drastically.

WRITE NO. 9 ON INQUIRY CARD—PAGE 34

For More Information about ad on facing page Write No. 10 on Inquiry Card—pg. 34→

PURCHASING

FACTS ON **K**ystone POWDER METALLURGY

—the answers at **KEYSTONE**  
have to be **RIGHT**...

(EVEN WHEN WE HAVE TO SAY NO)

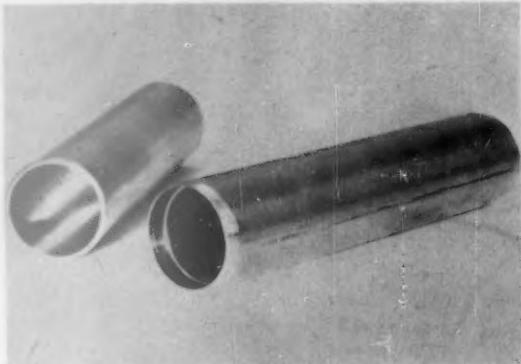
When you come to Keystone with a powder metal production requirement, you can depend upon our response. You'll receive straight answers to questions of design feasibility, tooling economics, choice of materials and finish, physical properties for specified performance, costs per thousand or per million pieces. Our answers to these and many other pertinent questions have to be right for you because they must be correct for us—and we have the know-how of a generation in the business to be sure. • Occasionally, we must say "no" to a projected application, if unsound for metal powder technology. But we do our best to aid in the re-design that will make production practical, and profit the customer and ourselves. • Why not sample the Keystone way of doing business, soon? It's made us the leading independent fabricator in the field.

**K**ystone CARBON COMPANY  
ST. MARYS, PA.

POWDERED METAL PARTS DIVISION

**V**  
VALUE ANALYSIS  
**A**

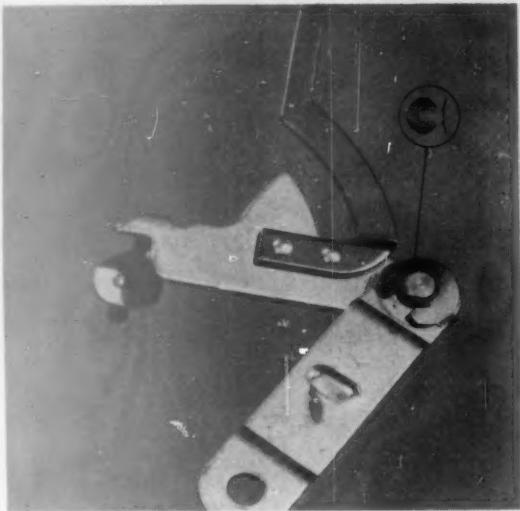
## Component Parts



### Careful Purchasing Cuts Cost Of Mercury Relay Housing 30%

By switching from a super finished tubing to a mill-burnished tubing, the Adams & Westlake Co., Elkhart, Ind., has eliminated an expensive broaching operation, gained better control over inventory, reduced handling, and improved quality control. As a result, cost of mercury relay housing was reduced 30%. The mill burnished type 304 tubing is manufactured by the Carpenter Steel Co.

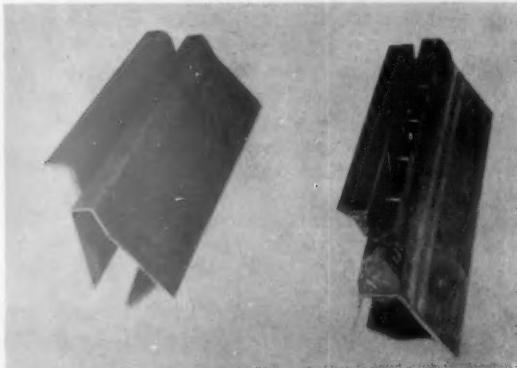
WRITE NO. 11 ON INQUIRY CARD—PAGE 34



### Retaining Ring Replaces Two Parts, Speeds Assembly of Control

To replace two parts and speed assembly of a heater control for passenger cars, the Ford Motor Company uses a Waldes Truarc 5139 locking prong ring. It is used to secure the hinge pin on which control plates pivot. Because of bowed construction, the fastener provides the right amount of spring tension to hold heater adjustment settings without binding parts. Prongs which grip shaft prevent ring from being forced out of groove.

WRITE NO. 12 ON INQUIRY CARD—PAGE 34



### Formed Cleaning Bar Saves 26% Of Cost of Cast Steel Design

Redesign of the cast steel cleaning bar used in a forage chopper manufactured by Fox River Tractor Co., Appleton, Wis., reduced cost of the part by 26%. The new design (left) is an L-shaped piece formed from  $\frac{3}{8}$ " mild steel. It is secured to the main head by four bolts located in slotted holes to provide easy adjustment and alignment. Design received award from James F. Lincoln Arc Welding Foundation.

WRITE NO. 13 ON INQUIRY CARD—PAGE 34

# Now available from your P-K® distributor...

# PARKER-KALON SOCKET SCREWS

the most complete line in the industry

## WITH LONG-LOK® INSERTS!

When design and production specify socket screws with self-locking inserts...ask your distributor to show you the Parker-Kalon line with the new Long-Lok feature.

P-K socket screws with Long-Lok inserts of Polycap, a nylon type polymer, completely eliminate the need for lock washers or intricate safety wiring. They are ideal for



use where frequent adjustment is a requirement . . . for thread-sealing applications...for extra holding power, even when subjected to severe vibration.

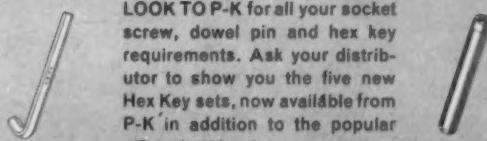
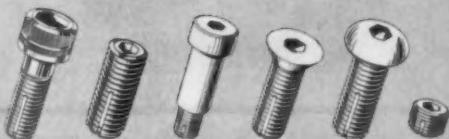
- Excellent performance over a wide range of temperature.
- No reduction in basic rated strength of the fastener.
- Meets requirements of MIL F 18240A (ASG) and NAS 1081 specifications.

*to fill all your requirements . . .*



call on your Parker-Kalon distributor for P-K socket screws with or without the Long-Lok insert. You can order either way and get speedy delivery of P-K quality-controlled socket head cap screws (1960 and 1936 series), set screws (including P-K's new W-Point™), shoulder screws, flat heads, button heads and pipe plugs.

ASK YOUR P-K DISTRIBUTOR FOR SAMPLES AND TECHNICAL BULLETIN NO. 862



LOOK TO P-K for all your socket screw, dowel pin and hex key requirements. Ask your distributor to show you the five new Hex Key sets, now available from P-K in addition to the popular #45 and #111 sets.

©T.M.

†U.S. Patent No. 2,807,246

# PARKER-KALON® *the complete line*

PARKER-KALON, a division of GENERAL AMERICAN TRANSPORTATION CORPORATION, Clifton, N.J., sold exclusively through Industrial Distributors.

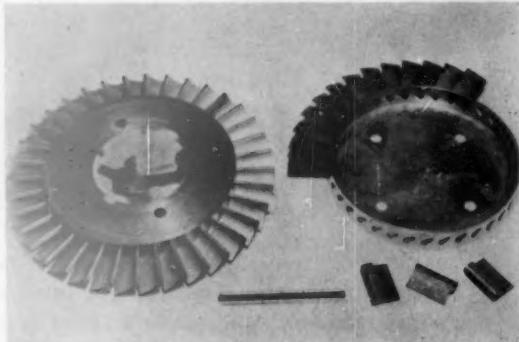
For More Information Write No. 14 on Inquiry Card—Page 34

MAY 23, 1960

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**V**  
VALUE ANALYSIS  
**A**

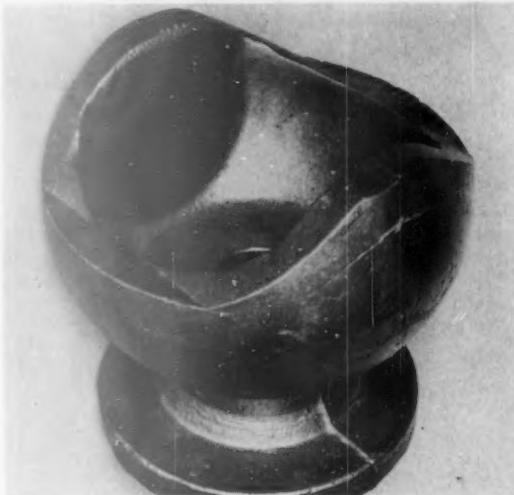
## Component Parts



### Redesigning Part for Brazeing Cuts Costs 80%

By redesigning a stainless turbine rotator assembly so that it could be produced by furnace brazing instead of forging, processing costs were cut 80%. The supplier who redesigned the rotor, Wall Colmonoy Corp., produces the part by brazing together a pre-machined stainless ring and disc. The ring is provided with air-foil-shaped slots which hold the blade root forgings. The forged blades are finish-machined to specifications prior to brazing.

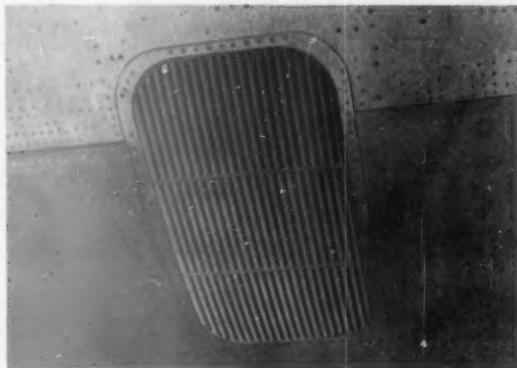
WRITE NO. 15 ON INQUIRY CARD—PAGE 34



### Eighty-Pound Upset Forging Replaces Ninety-five-Pound Casting

Ball joint housings for the steering and driving mechanisms of the Clark Equipment Co.'s Michigan end loaders and Turbo-Dozers are now being turned out by the Commercial Shearing & Stamping Co. as closed die forgings on an eight-inch upsetter. The parts were formerly produced as steel castings. There is a savings of 15 lbs. of metal on each unit when made as a forging. In addition, Clark reports an initial cost saving of 90¢ per part plus closer tolerances for a 10% machining cost saving.

WRITE NO. 16 ON INQUIRY CARD—PAGE 34



### Aluminum Die Castings Simplify Louver on Lockheed Electra

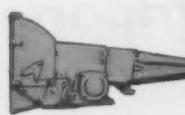
Three aluminum die castings, which form the exit louver of a condenser tunnel that provides cooling and auxiliary ventilation on the Lockheed Electra, have saved the builder many dollars. Originally, a pair of adjustable exit doors modulated the air flow. By changing to a fixed die cast louver, 31 parts were eliminated, assembly labor greatly decreased, and delivery time cut to a third of what it was formerly.

WRITE NO. 17 ON INQUIRY CARD—PAGE 34

Difficult fastening problems on brakes



transmission



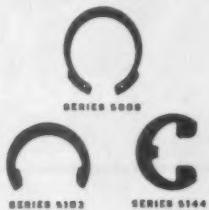
carburetor and

at 4 other key points on the 1960 FORD



were solved with Truarc

retaining rings.



Result: simple

design, easier assembly help make these

“The Finest Fords of a lifetime.”

### PURCHASING PROPOSITION:

Look beyond the initial price of the fasteners you are using. It's the final *installed* cost that really counts. That's where Truarc rings—and easy-to-use application tools, plus design help inside your plant—can cut costs. Truarc's uniquely broad line of standard rings and close-to-everyone network of more than 150 distributors create new savings for many firms. Our Catalog RR 10-58 shows how effectively Truarc Retaining Rings work on dozens of different products. Get your copy. For immediate action call your nearest Authorized Truarc Distributor. He's as close as your Classified Telephone Directory. Look under: "Rings, Retaining."

o.s



**WALDES  
TRUARC® RETAINING RINGS**

WALDES KOHINOOR, INC., 47-18 Austel Place, Long Island City 1, N.Y.

9 OUT OF 10 PRODUCTS CAN BE IMPROVED WITH TRUARC RETAINING RINGS

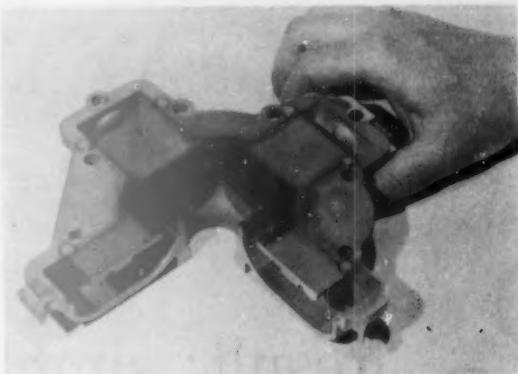
© 1960 WALDES KOHINOOR, INC.

For More Information Write No. 18 on Inquiry Card—Page 34

MAY 23, 1960

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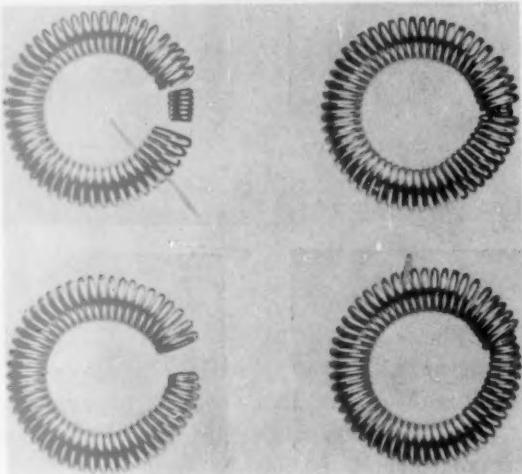
## Component Parts



### Adhesive Bonded Pump Casting Solves Reject Problem

A large pump manufacturer has reduced the rejection rate of pump castings from a high of 25% to zero. As a result the company is saving \$750 per 1000 castings. The dramatic improvement was made possible by using epoxy resin adhesive EC-1386, made by the Minnesota Mining & Mfg. Co. The adhesive is used to bond three separate die castings to make one complex pump assembly. Previously the part had been cast in one piece by the sand mold process.

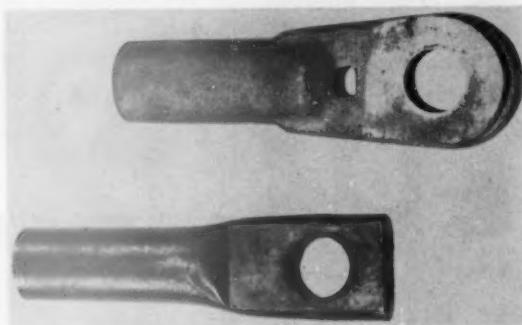
WRITE NO. 19 ON INQUIRY CARD—PAGE 34



### Two Springs Become One, Save Assembly Time and Cost

In checking excessive assembly costs, a circuit breaker manufacturer found that a spring used to retain components was a high-labor factor. As originally designed, a large and a small spring were screwed together by hand. The Associated Spring Corp. suggested redesigning to eliminate the smaller spring, and taper the larger. Resulting assembly is much faster and joint is stronger than before.

WRITE NO. 20 ON INQUIRY CARD—PAGE 34



### Switch to Malleable Cuts Component Cost 26¢ Per Part

Producing this drag link from steel tubing looks relatively simple, and it is—just flatten the tube and drill the hole. Machining and materials together cost only 68¢ for this part. But when the manufacturer switched to malleable, the drilling operation was eliminated by using a core. The part now costs 42¢. The conversion was worked out by foundry engineers at Lancaster Malleable Iron Co.

WRITE NO. 21 ON INQUIRY CARD—PAGE 34

**"Believe it or not,  
We rivet this UPSIDE DOWN  
...for a 54% boost  
in production"**

ANOTHER EXAMPLE OF TRS RIVETING KNOW-HOW

**Ekco Products Company** had been fastening wall brackets to their soap dishes and glass holders with solid aluminum rivets . . . hand-assembling the components and placing the assembly in a die which required two press strokes to fasten the parts. Production volume had reached a ceiling, and cost reduction was becoming imperative.

Automatic machine riveting, with semi-tubular rivets, would offer substantial savings, but obstructing flanges on the product itself seemed to rule it out . . . until the TRS man suggested a new viewpoint. Working with Ekco engineers, he proposed feeding the rivets upside down and inverting the assembly for the fastening operation, providing unobstructed travel for the rivet-setting driver. The rivets were kept with the heads visible, as required for good appearance.

**Result:** no hand assembly, daily output up 54%.

Let the TRS man look over your assemblies. You'll find that he has the viewpoint of a manufacturing engineer, and a knack for making fastening simpler, faster, better.

Of course he will recommend TRS rivets. But he will give you sensible reasons why they are more reliable in quality and uniformity. Superior quality control is one big result of a five-year modernization of this pioneer company — modernization of people, policies, production and service facilities. *You'll like to do business with the new TRS . . . we'll make sure of it.*

*Don't Buy Riveting Machines until you learn how the TRS PAR process revolutionizes riveting*



*If it's a Tubular Rivet TRS makes it . . . and Better*

For More Information Write No. 22 on Inquiry Card—Page 34

MAY 23, 1960

#### A PROFITABLE CHANGE IN VIEWPOINT

In the Ekco-Autoyre glass holder (shown) and soap dish, the rivet clinch must not be visible, but normal setting with the rivet heads on the visible surface was impossible because flanges on the product obstructed motion of the setting driver. To solve the problem, a semi-tubular rivet was designed with a flat head, to be fed and set in an inverted position with a TRS Model 103L machine. The end of the driver was shaped to form the clinch, and the machine was fitted with an air-operated pusher to eject the finished product.

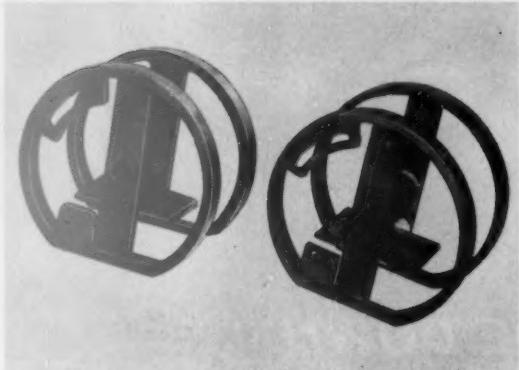


#### TUBULAR RIVET & STUD COMPANY

QUINCY 70, MASSACHUSETTS • TRS SALES OFFICES: Atlanta • Buffalo • Charlotte • Chicago  
Cleveland • Dallas • Detroit • Hartford • Indianapolis • Los Angeles • New York  
Philadelphia • Pittsfield • Quincy • St. Louis • Seattle. WAREHOUSE IN CHICAGO  
See "Yellow Pages" for phone numbers.



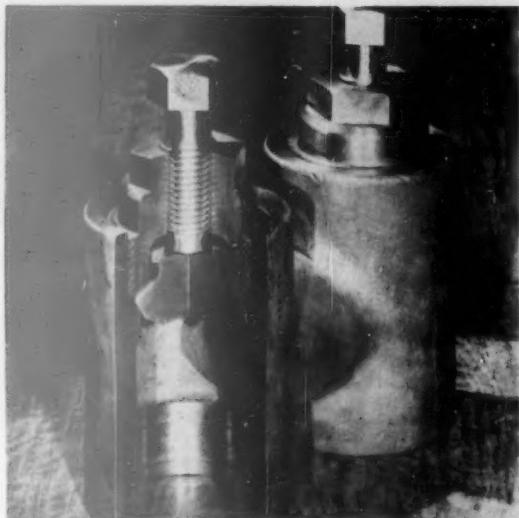
## Component Parts



### Change to Casting Cuts Cost 87% and Improves Product

A manufacturer of printing presses simplified production of a type cylinder by substituting a gray iron casting for a multiple part weldment. As a result, cost was reduced 87%, greater wear resistance increased product life, and welding plus seven finishing operations were eliminated.

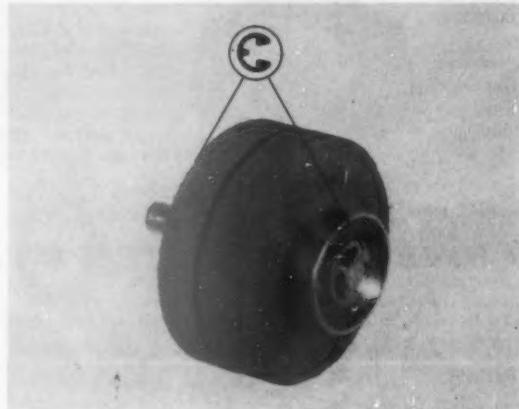
WRITE NO. 23 ON INQUIRY CARD—PAGE 34



### Cast Stainless Furnace Fittings Resist Severe Corrosion

Operating in an extremely corrosive environment, cast stainless header bodies have given years of trouble-free service and solved replacement problems in producing high-octane gasoline at the El Segundo plant of the Standard Oil Co. of California. Serving as return bends to control oil flow through furnace, fittings combine corrosion resistance of stainless alloys with design advantages of casting process.

WRITE NO. 24 ON INQUIRY CARD—PAGE 34



### Two Rings Simplify Drill Attachment and Save \$40/M

Babcock Mfg. Co., Oakland, Calif., uses two Waldes Truarc 5133-E-rings to improve design of its  $\frac{1}{4}$ " drill knife and scissors sharpener. The rings replace four parts, eliminate two threading operations, and reduce the shaft length by  $\frac{1}{4}$ ". Savings on machining and assembly time are \$40 per thousand units. One ring serves as shoulder for spring and grinding wheels; second ring locks entire assembly on shaft.

WRITE NO. 25 ON INQUIRY CARD—PAGE 34



## For Precision Molded Nylon Gearing

----- *Quinn-Berry of course!*

**CHELSEA 30, Mass.**  
Joseph Leader  
68 Marlborough Street  
Chelsea 3-3484

**CHICAGO 45, Illinois**  
R. H. Frish  
Room 211  
6349 N. Western Ave.  
Ambassador 2-6005

**DETROIT 35, Mich.**  
Harry R. Brethen Co.  
16577 Meyers Road  
Diamond 1-3454

**EAST ROCHESTER, N. Y.**  
Dynotherm, Inc.  
607 West Commercial Street  
Phone: Ludlow 6-0082

**KNOXVILLE, Tennessee**  
Harold J. Mellay  
2100 Alton Ave.  
P. O. Box 3207  
Phone: 2-5911

**MILWAUKEE 13, Wis.**  
John Weiland, Jr.  
7105 Grand Parkway  
Greenfield 6-7161

**ARDMORE, Pa.**  
Austin L. Wright Co.  
P. O. Box 361  
1 W. Lancaster Ave.  
Midway 2-5113

Unusual applications of precision molded nylon are routine projects at Quinn-Berry . . . gearing for a multitude of appliance, automotive and aviation components. The nylon gear shown above is molded directly onto the shaft to finish dimensions in one operation. Five separate operations were formerly necessary. The result? A 50% cost reduction and improved performance. Nylon gears by Quinn-Berry require no lubrication. They are quiet in operation . . . known to last 20 times longer than gears of other materials in many applications . . . have exceptional ability to withstand vibration.

Quinn-Berry is a pioneer in the precision molding of nylon as well as other thermoplastic materials. For your component parts, put it up to Q-B where the "Unusual is Routine."

WE FLY TO SERVE YOU FASTER!



**QUINN-BERRY CORP.**

2609 WEST 12TH STREET, ERIE, PA.

MANUFACTURERS OF  
ALL TYPES OF  
THERMOPLASTICS



For More Information Write No. 26 on Inquiry Card—Page 34



## Component Parts



### Supplier's Switch to Tubular Material Cuts Part Cost 20%

Cost of manufacturing refrigerator door hinge bracket assemblies was cut 20% by the National Lock Co. The saving was passed on to the customer, a major appliance manufacturer. Two changes were made in the initial production design. The hinge pin, instead of being machined from solid bar stock and then projection-welded into the bracket, is now made from tubular material and staked into the bracket. The new method uses less material and is a lower-cost process.

**WRITE NO. 27 ON INQUIRY CARD—PAGE 34**



### Change in Material Means No Deburring, \$4.17 saved per Part

Deburring this bull gear was costly when the part was made in steel. In switching to pearlitic malleable iron, deburring wasn't necessary and machine costs were reduced \$3.82 on each unit. Together with a reduction in material cost, the Erie Malleable Iron Co. saved customer \$4.17 per part, equal to \$12,500 for a year's production.

**WRITE NO. 28 ON INQUIRY CARD—PAGE 34**



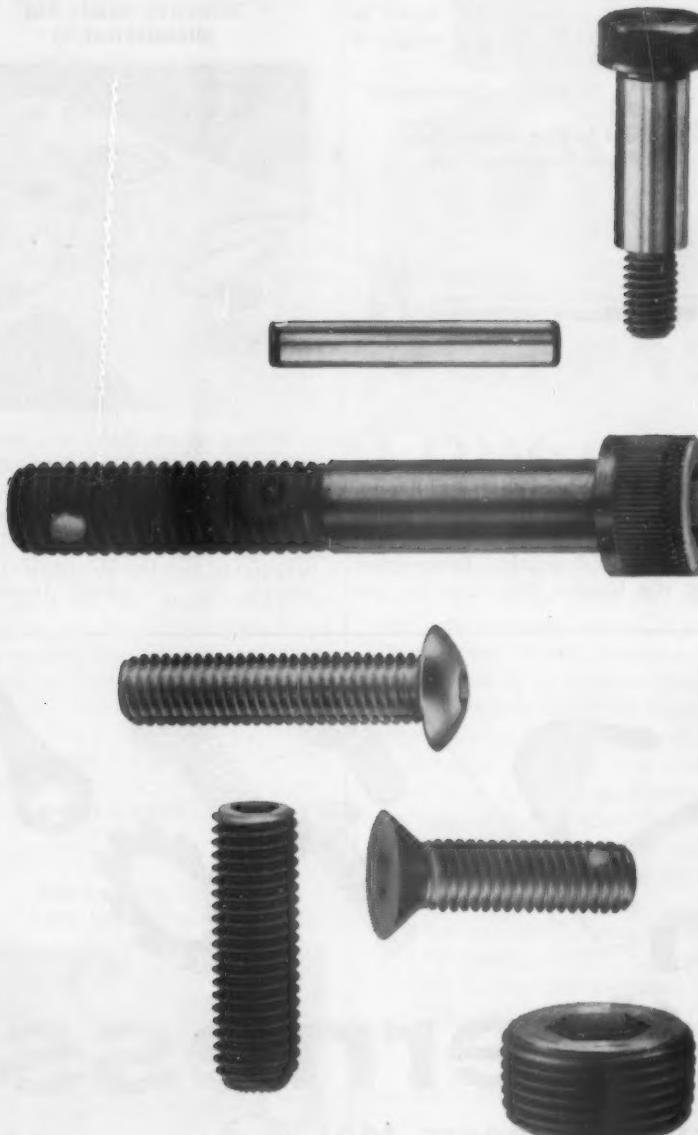
### Special Fastener Solves Design and Cost Problems

To hold a board rigid to the guide, a table saw manufacturer first tried a "C" clamp, later switched to a hand-assembled 3-piece post clamp. The "C" clamp wouldn't hold, the post clamp was costly. Pheoll Mfg. Co. designed and assembled a single unit which replaced three parts manufactured by separate suppliers. Part cost was lower and assembly operation was eliminated.

**WRITE NO. 29 ON INQUIRY CARD—PAGE 34**

## 5-POINT VALUE ANALYSIS:

### UNBRAKO SOCKET SCREWS



**1. AVAILABILITY**—your authorized SPS distributor has on his shelves right now the complete UNBRAKO line. You get what you order—quickly.

**2. RESEARCH**—original SPS research aimed at developing the inherent strength of fasteners pushes back limitations. Recent SPS development: UNBRAKO pHd\* cap screw with Hi-Life thread, providing up to twice ordinary fatigue strength.

**3. RELIABILITY**—the most progressive metalworking techniques, plus precision plating, controlled atmosphere heat treating, close tolerance surface finishing, integrated tool and die design assure faultless UNBRAKO performance.

**4. TESTING**—the most extensive facility in the fastener industry, including complete equipment for certifying the finished part under both static and dynamic loading—at temperatures to 1800F.

**5. All at no extra cost!**

*Write for Bulletin 2338,  
describing the UNBRAKO line*

#### Standard UNBRAKO Screw Products

PRODUCT	DIAMETERS
---------	-----------

Socket Head Cap Screws.... #0 to 1½ in.  
Socket Set Screws..... #0 to 1 in.  
Flat Head Socket Screws..... #0 to ¼ in.  
Button Head Socket Screws... #0 to ½ in.  
Shoulder Screws..... ⅛ in. to ¾ in.  
Dowel Pins..... ⅛ in. to 1 in.  
Pressure Plugs..... ⅛ in. to 1½ in.

Stainless steel cap and set screws are stock items. All other UNBRAKO products are available in stainless steel on order.

\*pHd stands for "proper head design" (1960 series)—a factor in higher product reliability.

For More Information Write No. 30 on Inquiry Card—Page 34

MAY 23, 1960

**SPS**  
*where reliability replaces probability*

**Welded Design Reduces Cost 20%**



Redesigning a cast steel knife head to a weldment saved Fox River Tractor Co., Appleton, Wis. 20% in the cost of the part. A performance advantage gained from the thinner flange section of the welded design was the faster flow of material through the cutting area. The design received an award from the James F. Lincoln Arc Welding Foundation.

Write No. 140 on Inquiry Card—Page 34

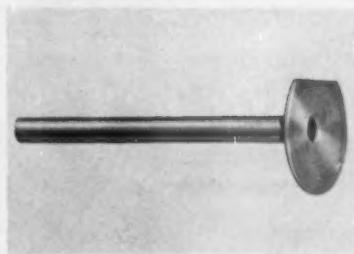
**Aluminum Cuts Cost of Oil Can Spout by Third**

Material costs in making oil can spout tips have been reduced by the National Acme Co., Cleve-

land, Ohio. By changing from brass screw machine stock to aluminum supplied by Alcoa, National Acme has saved 35.4% on material costs for the part. These savings were made possible because the lighter weight aluminum stock makes three times as many pieces as an equal weight of brass stock.

Write No. 141 on Inquiry Card—Page 34

**Cost Is Cut When One Piece Replaces Two**

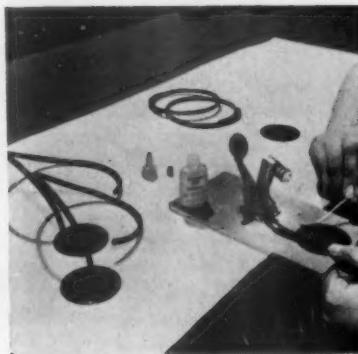


Originally designed as a two-piece assembly of shaft and flange, close concentricity required in tuning shaft made manufacture difficult and costly. Redesigned by the Risdon Mfg. Co. for the

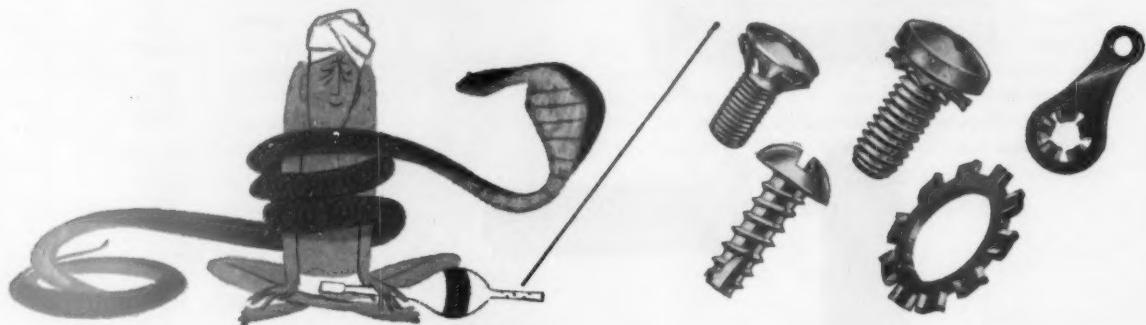
assembler, a one-piece drawn component was produced automatically, at high speed, within the needed tolerances, and at lower cost.

Write No. 142 on Inquiry Card—Page 34

**Adhesive Bonds Aid Miniaturization**



Where space does not permit use of mechanical connectors, high-strength adhesives can provide permanent bonds between dissimilar materials. The ASCOP division of Electro-Mechanical Research, Inc. Princeton Junction,



# Togetherness

matters with industrial fasteners, too!

Togetherness, industrial style, has a special meaning at Thompson-Bremer because we are one of the few fully integrated manufacturers of Sems, lock washers, thread-cutting screws, terminals and cold-headed specialties. With our engineering services and components manufacturing together under one roof, we can give you faster, more individualized service at competitive prices. We'll bid on your specials requirements, or fill orders for standard items on short notice from the extensive line of EVERLOCK products stocked by your local distributor.

If you buy or specify industrial fasteners, you want whatever your company assembles to go together economically and stay together reliably. Send for catalog and samples or call your EVERLOCK representative.



**Everlock**  
INDUSTRIAL FASTENERS

Thompson-Bremer & Co.  
Division of  
American Machine  
& Foundry Company

Thompson-Bremer & Co., Dept. 50  
228 N. LaSalle St., Chicago 1, Ill.

Please send me:

EVERLOCK fastener catalogs \_\_\_\_\_ samples of  
EVERLOCK industrial fasteners and cold-headed specialties.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

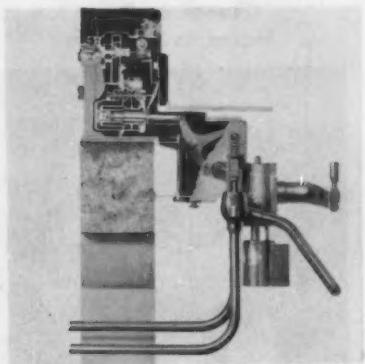
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

For More Information Write No. 31 on Inquiry Card—Page 34

N.J., uses Eastman 910 adhesive to bond vinyl sleeve to aluminum cover plate in its tiny digital encoder. The adhesive forms rapid bonds, and does not require catalyst, evaporation, or pressure to set.

Write No. 143 on Inquiry Card—Page 34

**Simpler Pedestal Casting Cuts Cost, Improves Part**



Cast design for new forward bearing pedestals in Allis Chalmers turbines eliminates welding of plate in the pump chamber area by substituting a single casting welded into the pedestal. Cost analysis show savings of up to 30% in manufacturing costs of the pedestal. In addition design is improved by affording better accessibility.

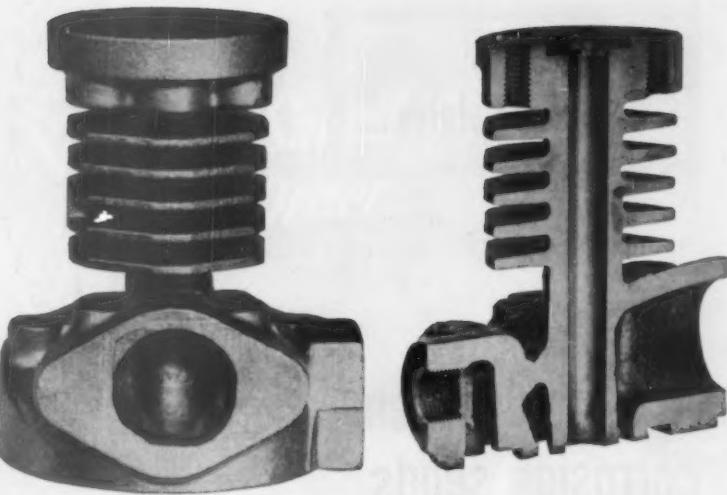
Write No. 144 on Inquiry Card—Page 34

**Self-Locking Screws Save Overtime Labor**



Self-locking Unbrako cap screws were substituted for conventional cap screws on 500 and 1000 ton presses at the Prosperity Co., Syracuse, N.Y. Following loosening—

(Please turn to page 122)



## **HIGH PRESSURE LOW COST**

This 8 pound Meehanite Metal casting made for the Joy Manufacturing Co. by Hamilton Foundry is a fourth stage air compressor cylinder. Pressures build up to 6,000 p.s.i. and require a high strength, pressure tight and wear resisting casting. Alloyed Meehanite®, oil quenched and tempered, raised Brinell hardness of the cylinder wall to 275-300, and increased tensile strength to 60,000 p.s.i. Meehanite was chosen for this casting because controlled structure and small uniform flake graphite produce pressure tight castings of uniform density and strength.

Manufacturing costs drop when uniform, high quality castings go through production. In this case, Meehanite castings from Hamilton Foundry give Joy tight control on finished parts costs by combining dimensional accuracy, uniform machinability, a low rejection rate, and delivery on schedule. Pressure tightness, long service life and fine surface finish insure Joy's reputation for product quality.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD



# **HAMILTON FOUNDRY**

INC.

1551 LINCOLN AVENUE • HAMILTON, OHIO • TWINBROOK 5-7491

For More Information Write No. 32 on Inquiry Card—Page 34

**Life in these  
excited states ...**

"Stop saying  
*'There goes Old Faithful'*  
and get it fixed!"

## What to do when corrosion sends costs sky high

No one can afford ruined equipment, endless repairs, and plant shut-downs caused by corrosion. And you *shouldn't* afford over-design and too-fancy equipment. Ace takes you right down the middle . . . a wide choice of chemical-resistant pipe, pumps, valves, tanks, etc. Best for the money anywhere . . . backed by 108 years' experience.

### TEMIRON for hot jobs

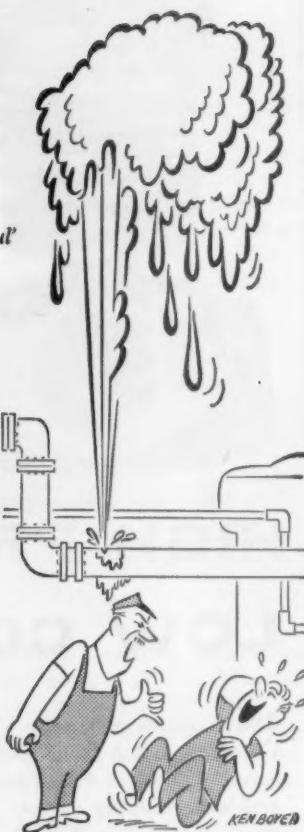


Best non-metallic pipe anywhere for hot chemicals to 275°F. Also handles tough organics. Rigid, tough nitrile. Pipe and fittings to 8". Bul. 96A.

### "BONDED STORAGE" for corrosives



Heavy Ace rubber and plastic tank linings unexcelled for alkalies, acids, bleaches, salts. Faultless seams, indestructible bond, shock and age-resistant. All shapes. Bul. CE-53.



(Continued from page 121)

ing of screws from shock and vibration of blanking and piercing runs on boiler plate up to  $\frac{1}{2}$  inch thick, presses formerly required weekly tightening; at overtime rates, in order not to interrupt production. With self-locking screws retightening is required only once in five months.

Write No. 145 on Inquiry Card—Page 34

### Change to Brass Increases Tool Life



Because the application called for extremely close straightness and roundness, the Tait Manufacturing Co. made pump diffuser casings from steel. However, material was difficult to work and draw, and tool life too short. After performing numerous tests, company turned to Revere cartridge brass strip which was found to have superior drawing properties, is more easily worked, and increased tool life. Brass part performs well in the pump.

Write No. 146 on Inquiry Card—Page 34

**ACE**  
processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY  
DIVISION OF AMERACE CORPORATION  
Ace Road • Butler, New Jersey

For More Information Write No. 33 on Inquiry Card—Page 34



See our pages  
in  
**ace**  
Catalog!



"Clarence handles all our petty cash purchases."



## Flash butt-welded ring from extruded material slashes away 64 lbs. of stainless 310

Only 1/3 as much material was required when a special extruded section was substituted for bulky bar stock in this flash butt-welded ring. By leaving 2/3 of the material at the mill, instead of hogging it out, Amweld saved its customer \$76.83 per ring—plus hours of expensive machining. (Savings compared to the forgings originally used are even greater.)

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and complete machining facilities, phone or write.



### GET THE FACTS ABOUT AMWELD

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

**AMWELD®**  
INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MFG. CO. • 601 DIETZ ROAD • WARREN, OHIO

For More Information Write No. 34 on Inquiry Card—Page 34

MAY 23, 1960

123

# ALLEN

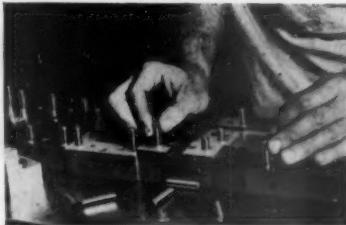


**ALLEN is  
the dowel pin  
that gives  
you PLUSES !**

Your ALLEN Industrial Distributor can show you a good many ways to use ALLEN Dowel Pins, in addition to conventional uses in tool and die work. You can use them as economical roller bearings, axles, precision plugs, hinge and wrist pins—and in many other ways.

You can cut the cost of your product substantially, too—because your ALLEN Distributor can supply these strong, accurate, mirror-finished Dowel Pins in standard sizes right from stock.

Made of special Allenoy steel; surface hardened to 62-64 Rockwell C; precision ground to .0001" with micro-inch finish of 6 RMS max. Check your Allen Handbook or Catalog for detailed specs and standard sizes, or write direct for samples and technical information.



Genuine ALLEN products are available only through your ALLEN Distributor—he's always ready, willing and able to give you prompt, practical service.



**ALLEN MANUFACTURING COMPANY**

HARTFORD 1, CONNECTICUT, U.S.A.  
For More Information Write No. 35 on Inquiry Card—Page 34

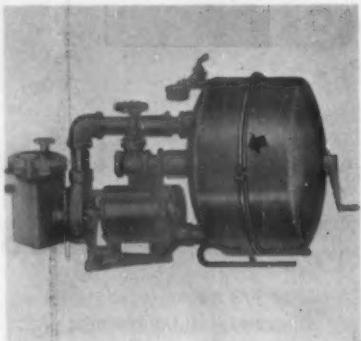
**Glass Cylinders Cut Maintenance Cost**



Glass was selected by the Charles Bruning Co. as material for big cylinders in high-speed whiteprint copying machines because it transmits high-volume ultra-violet light, withstands thermal shock, and is virtually maintenance-free. Cylinder carries document to be copied and sensitized material past light source. Smooth, hard surface of the Corning glass does not statically attract dust and contains no pits or hollows to collect dirt.

Write No. 147 on Inquiry Card—Page 34

**V-Band Couplings Simplify Filter Design**



V-Band couplings cut manufacturing costs and improved functional design and appearance of swimming pool filters manufactured by Swimquip, Inc. By using a Marman V-Band coupling to join two halves of filter tank, assembly time is considerably decreased. Only two nuts and bolts are required to join and seal tank. Previous assembly required fastening 36 nuts and bolts on sheet metal flanges.

Write No. 148 on Inquiry Card—Page 34



# PRODUCTION UP

## COSTS DOWN

WHEN YOU USE  
**BARNES**  
HIGH SPEED STEEL  
BANDS



The new Barnes High Speed Steel Band Saw Blades out-cut and out-last carbon steel bands many times over. They also cut with ease most of the hard-to-machine alloys that carbon blades cannot cut.

Call your Barnes distributor for the facts on the best in precision cutting tools—Barnes High Speed Steel Band Saw Blades.

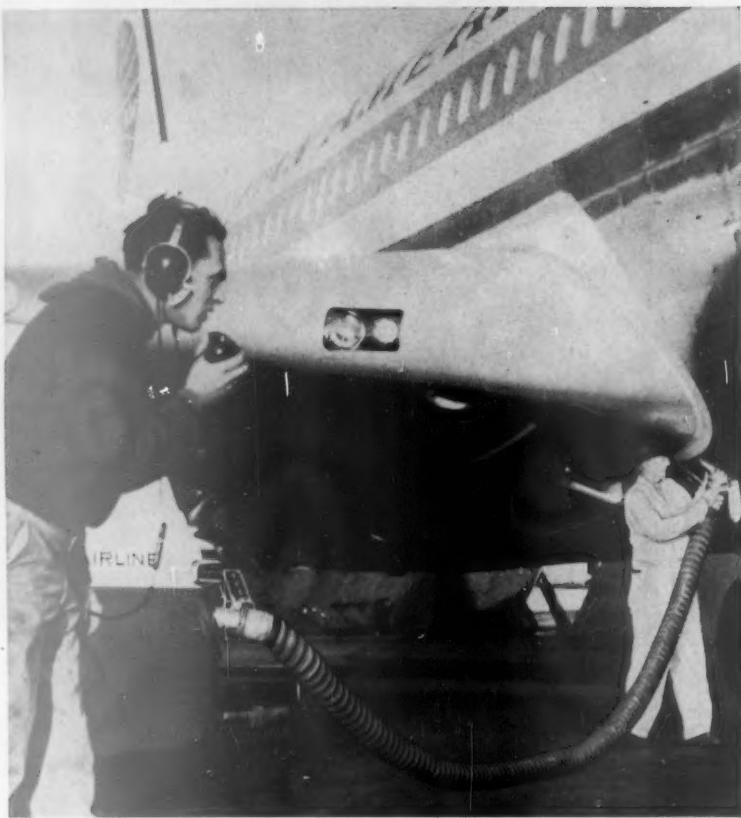


For More Information Write No. 36 on Inquiry Card—Page 34

MAY 23, 1960

**w. o. BARNES CO., INC.**  
1297 TERMINAL AVENUE • DETROIT 14, MICHIGAN

125



"Our previous hose gave out after only 1200 to 1400 starts . . .

## Thermoid-Quaker Jet-Starter Hose good as new after 3500 starts"

says Mr. B. V. Darress, Maint. Supr. Pan American World Airways.

Jet-starter hose has to take unusual abuse: transmit hot air up to 500°F at up to 600 MPH under sub-zero conditions . . . withstand dragging over abrasive surfaces. Yet it must be light-weight and flexible . . . easy to handle and coil—and it can't kink, collapse, burst or flake off inside.

Thermoid-Quaker Jet-Starter Hose meets these strict specifications and has proved its worth with Pan American World Airways and the U. S. Air Force. According to Mr. B. V. Darress of PanAm, previous hose became un-serviceable after only 1200 to 1400 starts. Thermoid-Quaker hose has already outlasted former hose by three to one and still looks like new!

Service like this is important to both commercial and military jet operations. In fact, this hose was developed for military use. "Dacron" cross-braid construction distributes the load evenly, prevents kinking; and the seamless silicone rubber tube and bonding layer resist heat and flaking. Yet the hose remains flexible in any kind of weather.

Get complete information, including Technical Data from your Thermoid Division industrial distributor, or write Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, New Jersey.

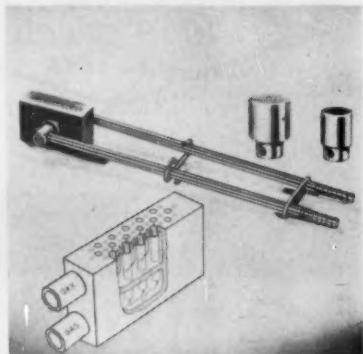
**THERMOID** **PORTER** **DIVISION**

**H. K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

For More Information Write No. 37 on Inquiry Card—Page 34

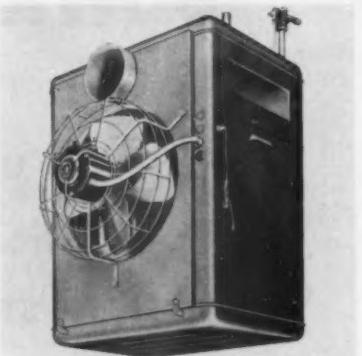
### Improves Burner Design With Needle Tubing



The Bethlehem Apparatus Co., Hellertown, Pa., uses stainless steel hypodermic tubing supplied by the Superior Tube Co. in its ribbon type burners, which mix fuel gas and oxygen at the flame surface instead of internally. Extremely close tolerances, hard temper, and bright clean finish which permits free flow of gases are needle tubing features which made new design possible.

Write No. 149 on Inquiry Card—Page 34

### Using "Scrap" Steel Saves Material Cost



The Reznor Manufacturing Co., Mercer, Pa., has found use for the scrap steel which remained when holes were punched in space heater casings. The company is using the circular piece of cold rolled steel sheet, formerly discarded, to fabricate a one-piece, four-bladed propeller fan. Prior to making fan blades from this "scrap", Reznor purchased aluminum blades from outside suppliers. Steel blades work as well and cost less. Cold rolled sheet is supplied by Jones & Laughlin.

Write No. 150 on Inquiry Card—Page 34



## Weighs a 64% cost reduction



Fastener survey by RB&W seeks to deliver maximum holding power per fastener-dollar ... makes possible substantial savings

Since the job of a standard fastener is mainly to hold an assembly together, its "clamping force" is what you really want. You can reduce costs by applying this fact and buying fasteners by their *holding power* rather than size.

For example, compare SAE "proof load" and cost ratios of four different hex screws of standard steels.

Grade	SAE Grade 5	SAE Grade 2	SAE Grade 2	SAE Grade 2
Size	3/4 x 5"	1 x 5"	1 1/8 x 5"	1 1/4 x 5"
Proof load (lbs)	28,400	16,950	21,350	27,100
Cost Ratio	100%	100%	23%	27%

Almost unbelievable. The smallest—the heat treated RB&W High Strength Hex Screw—exceeds all the others in load capacity, can usually be used instead of any of them. But, since it's smallest and weighs less, it also costs you less. 64% less than the 1 1/4" Grade 2 screw; 58% less than the 1 1/8", etc. And because holes can be made smaller, you save on production, too.

Want to get the most from *your* fastener dollars? Let a specialist who best knows the subject of fasteners contribute his knowledge to that of your engineers. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.



Plants at: Port Chester, N. Y.; Coroopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland; Milwaukee; New Orleans; Denver, Farge. Distributors from coast to coast.

For More Information Write No. 38 on Inquiry Card—Page 34

MAY 23, 1960

**Changed Forging Method  
Saves \$29 per Piece**



A sprocket for a coal cutting machine made by an Eastern firm used to be machined from a flat pancake forging. Now a Bethlehem Steel drop forging reduces manufacturing cost by \$29.00 per piece. Only machining needed is to finish bore and take light cuts on the outside tooth contour.

Write No. 151 on Inquiry Card—Page 34

**Aluminum Cuts Machining  
Time, Saves 34%**

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., has

realized substantial savings in machining time by switching from steel to Alcoa aluminum screw machine stock. In machining a hub for an automatic temperature control, the time per thousand parts was cut from 4.7 hours to 1.9 hours, achieving a 34% savings in over-all costs.

Write No. 152 on Inquiry Card—Page 34

**Laminate Costs 60% Less  
Than 11-piece Assembly**

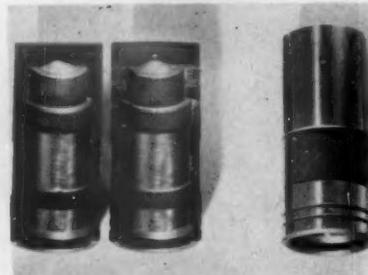


A 60% reduction in cost was achieved when the Spaulding Fibre Co. fabricated a conveyor drag flight from laminated plastic. The new part wears longer, is

easier to operate, and weighs six times less than the 11-piece steel-and-rubber assembly it replaces. The part is used to push abrasive materials through troughs.

Write No. 153 on Inquiry Card—Page 34

**Accurate Microhoning  
Eliminates Boring**



Microhoning valve tappet bores has eliminated the need for a precision boring operation at Johnson Products Inc., Muskegon, Mich. The bores are microhoned to within a 30 millionths-inch tolerance for roundness and straightness. In a typical production run of 31,250 parts, scrap amounted to only three-tenths of 1%.

Write No. 154 on Inquiry Card—Page 34

*Now... from*  
**UNITECH Products, Inc.**

**Precision Quality Bearing Balls**

**HIGH CARBON CHROME**



**STAINLESS STEEL**



*... in quantity from  
New York warehouse stock*

WRITE, WIRE, PHONE TODAY ...

**UNITECH Products, Inc.**

50 CHURCH STREET

WORTH 4-3365

NEW YORK 7, N. Y.



National Distributors for  
KUGELFISCHER GEORG SCHAFER & CO.



For More Information Write No. 39 on Inquiry Card—Page 34

# FREE CATALOG



## At Savings too!

You'll find the answer to low cost small plastic parts (up to 6 oz.) in new Wilcox mold-making techniques and close tolerance molding.

WRITE FOR THIS NEW FREE CATALOG TODAY

**WILCOX PRODUCTS CO.**  
3451R Dakota Ave., Minneapolis 16, Minnesota

For More Information Write No. 40 on Inquiry Card—Page 34

## SOLVING MATERIAL DESIGN PROBLEMS FABRICATING

**Buy the parts not the problems.** From large and unusual shapes to parts so small you inspect with a jeweler's glass . . . CDF's special fabricating facilities can do your job faster, more economically.



Every part pictured above is completely fabricated by CDF, except the etching operation for the printed circuits.

There's an excellent chance you can save on set-up and production time, and reduce unit costs by asking CDF to give you an estimate on final fabrication of laminated plastics, vulcanized fibre and electrical insulating materials.

Our machines, all 2,000 of them, are set up for just one purpose—the forming, machining and molding

of the many types of materials that we produce. Most important of all, you can combine economy with the exact properties you're looking for. CDF offers you a choice of materials from the industry's widest selection of laminated plastics, vulcanized fibre and electrical insulating materials. Check your Sweets PD file or write for General Folder 60.



# CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE  COMPANY • NEWARK 41, DEL.

In Canada, 46 Hollinger Road, Toronto 16, Ont.



**Machining** low-cost tracks for sliding glass doors. Made by CDF from Diamond vulcanized fibre. It's tough, yet light in weight.

**Molding** automobile timing gear blanks made from CDF's Celoron molding material for maximum wear and a minimum of noise.

**Postforming** back-up disc for a sander. Made from a Dilecto laminated plastic to get maximum toughness and resiliency.

For More Information Write No. 41 on Inquiry Card—Page 34

# MELLOWES Lock Washers



ARE BACKED  
BY  
MONEY-SAVING

## Service Policies

In addition to modern functional packaging Mellowes has established Customer-Service-Policies that save valuable time for users and distributors. For example:

**MELLOWES**  
prepays the  
freight on  
shipments of  
200 lbs. or more

You save money, too, on shipments of less than 200 lbs. because all shipments are made from the nearest Mellowes warehouse.



**MELLOWES**  
accepts orders  
Long Distance  
COLLECT!

**MELLOWES**  
simplifies  
your paper  
work



**MELLOWES SHIPS**  
from 3 convenient  
warehouse  
locations



**MELLOWES**  
handles  
orders  
FAST



Orders for Mellowes Lock Washers are usually shipped the same day received, via fast carrier, from the Mellowes warehouse nearest you! Ample stocks of Mellowes Lock Washers in all standard sizes assure prompt shipment of your orders.

Mellowes customer-service-policies are designed to make it easier and less costly to buy your lock washers from Mellowes, the Originators of COIN-PAK, JOB-PAK and other forms of Modern Functional Packaging.



Write for Current Prices

**LOCK WASHERS**

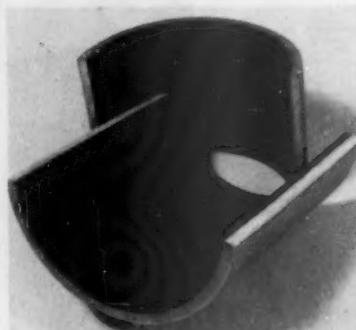
**THE Mellowes CO.**

141 E. Nash Street • Milwaukee 12, Wisconsin

Manufacturers of a Complete Line of Lock Washers in all Standard and Special Sizes, Non-Ferrous and Plated in Bulk, Conventional and Special Packages, Coin-Pak and Job-Pak.

For More Information Write No. 42  
on Inquiry Card—Page 34

## Plastic Bearing Needs No Lubrication



In three different installations users report savings in maintenance costs after changing to new greaseless Panelite bearings that need no lubrication and run with little or no wear. Made of a combination of plastic materials by the St. Regis Paper Company, the bearing has unusual strength and moisture resistance plus an extremely low coefficient of friction.

Write No. 155 on Inquiry Card—Page 34

blanks and saving half the cost.

The rings, supplied by the American Welding and Manufacturing Co., are formed from carbon steel bars welded at the joint. Because



flash butt-welding uses no filler metal, the joint is no harder than the rest of the ring. Welded rings are made to close tolerances requiring less material removal in manufacturing. Weight of a 310 lb. welded ring is 65 lbs. less than a comparable forged ring.

Write No. 157 on Inquiry Card—Page 34

## Coining Technique Permits Design Change



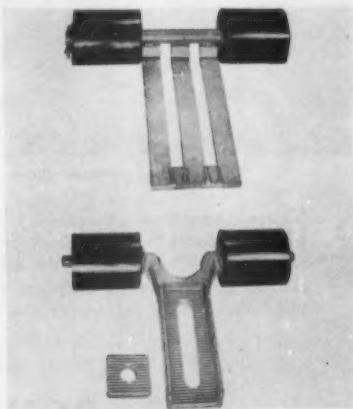
A new design using a coining technique developed by the Detroit Stamping Co. eliminated the need for a purchased component and an extra assembly operation in manufacturing a compressor valve mounting flange. Making the shoulder and neck extensions an integral part of the body and re-processing job into a single progressive stamping operation saved cost of shoulder button and press-fitting operation.

Write No. 156 on Inquiry Card—Page 34

## Butt-Welded Rings Cut Gear Blank Cost in Half

Major gear manufacturers report using flash butt-welded rings in place of forged or cast gear

## Malleable Casting Is Strong and Looks It



Needing not just a stronger part, but one that looked stronger, a boat trailer manufacturer converted the keel and hull roller brackets for his entire line to malleable iron castings. Brackets were formerly produced as weldments in his own shop. In the redesign, the Lakeside Malleable Castings Co., Racine, Wis., added rib supports at points where weldments failed. Malleable brackets resist rust and bolt holes can be punched without leaving a burr.

Write No. 158 on Inquiry Card—Page 34



## *What pressure gauge for your particular need?*

The clear-cut economical answer to your specific gauge problem is right here in the Marsh line. It is here because the Marsh line contains the world's most complete range of gauges in the three broad brackets of gauge applications.

**THE "MASTERGAUGE" GROUP**...for those extreme services that demand the ultimate in gauge precision, accuracy and stamina.

**THE "QUALITY" GROUP**...also for tough conditions, but less severe than the conditions served by the "Mastergauge" Group.

**THE "STANDARD" GROUP**...for the general run of pressure gauge services.

While these three brackets run a wide gamut of prices, the difference between them is not so much a matter of *grade* as a matter of *kind* and *purpose*. All gauges in all groups reflect Marsh precision and quality. Collectively they cover practically every conceivable gauge requirement.

The answer is in the catalog...but if you have a special problem let our engineering department work with you to select the most efficient, most economical solution to your problem.

### MARSH INSTRUMENT COMPANY

Division of Colorado Oil and Gas Corporation

Dept. G, Skokie, Illinois

Marsh Instrument & Valve Co., (Canada) Ltd.,

8407 103rd St., Edmonton, Alberta, Canada.

Houston Branch Plant, 1121 Rothwell, St.,

Sect. 15, Houston, Texas

*In stock at  
your nearest  
Supply House*

# MARSH



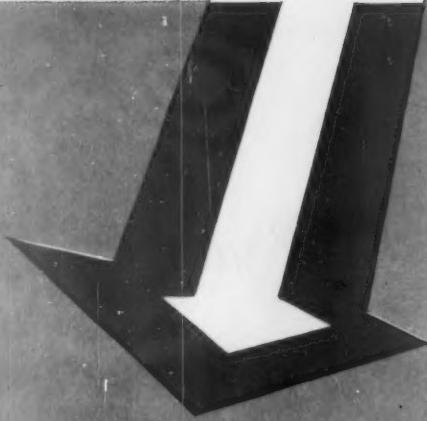
For More Information Write No. 44 on Inquiry Card—Page 34

MAY 23, 1960

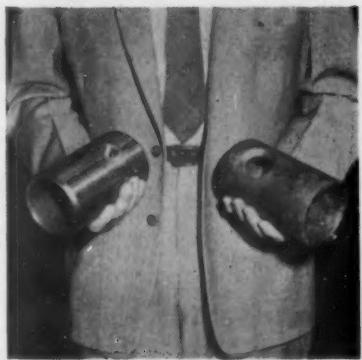
# SERVING INDUSTRY'S GRAY IRON CASTING REQUIREMENTS FOR OVER THREE DECADES

THE FOREST CITY  
FOUNDRIES COMPANY  
2500 WEST 27TH STREET  
CLEVELAND 13, OHIO

For More Information Write No. 45 on Inquiry Card—Page 34



## High Alloy Casting Improves Service Life



An estimated 250% increase in service life plus more complete soot removal has resulted from the use of high alloy shell-molded nozzle heads in a new soot blower designed for stationary and marine high temperature boilers. The cast alloy resists temperatures up to 2300 degrees F. and severe thermal shock from high velocity steam. Nozzle heads are made by Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.

Write No. 159 on Inquiry Card—Page 34

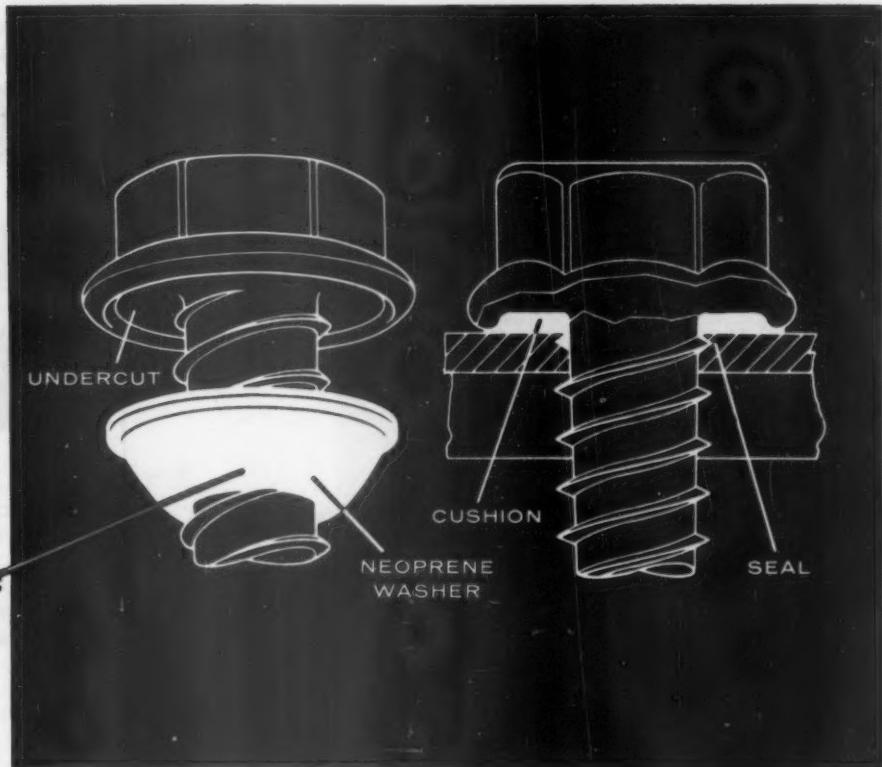
## Metal Edge Filters Improve Resin Quality



At Union Carbide Plastics Co. metal edge filters purify liquid phenolic resins ranging from the highly viscous to relatively fluid. Originally installed in 1940, the metal edge filters have been in continuous operation and are returned to the manufacturer, Puro-lator Products, Inc., only for normal rewinding. Metal edge filters permit company to run on semi-continuous basis. Without them, it would be necessary to strip down still between batches.

Write No. 160 on Inquiry Card—Page 34

NAT'S  
quick facts  
about  
Fasteners...



## With **TUFF-TITE** Fasteners TRADEMARK ...it's the **cushion control** that counts!

You can be very sure of this, in using Tuff-Tite® Cushioned Fasteners.

The preassembled neoprene washer won't ooze off in just any old direction when it's compressed under the head.

It will stay put and do what it's intended to do:

- Form a firm, even cushion under the head • Seal off the fastener hole
  - Prevent fluid leaking past the thread
  - Dampen vibration noises around the head • Protect fine finishes against marring and crazing
- ... because Tuff-Tite's undercut head and tough molded neoprene washer assure consistent cushion control. The undercut confines the spread as the washer is compressed, and the molded

shape guides the flow into the top threads, to seal the hole.

It's as simple and as certain as that, for any application requiring fastener sealing and cushioning. Tuff-Tite Fasteners\* are available as Machine, Self-Tapping, or Wood Screws, as Stove and Roofing Bolts, and can also be made as Special Fasteners. We'll be glad to work with you on your possible applications.

\*More details and specifications on standard types and sizes are given in the Tuff-Tite Fastener folder. Write for your copy.



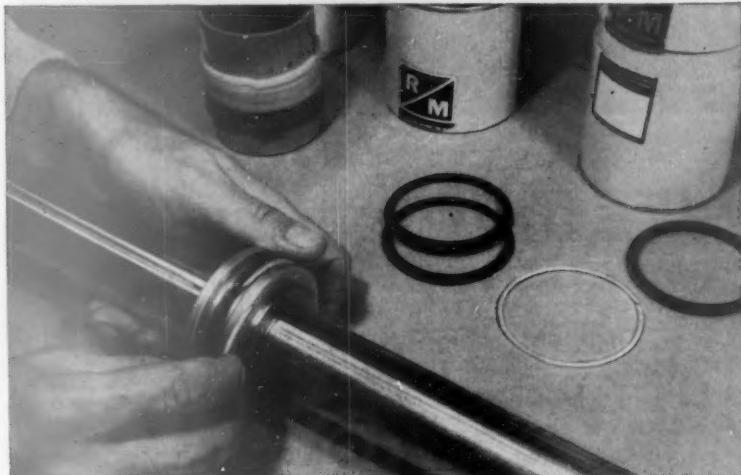
**The National Screw & Mfg. Company • Cleveland 4, Ohio**

California Division, The National Screw & Mfg. Company • 3423 South Garfield Avenue, Los Angeles 22, California

For More Information Write No. 46 on Inquiry Card—Page 34

# Why pass up “TEFLON” know-how?

*Go where it's greatest—R/M*



Thousands of these R/M "Teflon" rings retain 450°F fluid under great pressure in the hydraulic systems of the X-15 . . . an example of R/M know-how—know-how that can also work for you.

Where "Teflon"\*\* is indicated for a vital electronic or mechanical part, it doesn't pay to pass up the "Teflon" know-how of R/M.

No one knows better than R/M how to process "Teflon" into sheets, rods, tubes, tape and machined parts. No one can better meet your specs and your production schedules. From

R/M you get complete "Teflon" service, including bondable "Teflon."

To learn what we mean by service, talk to the man from R/M. Call the nearest R/M district office listed below, or write Plastic Products Division, Raybestos-Manhattan, Inc., Manheim, Pa.

\*Du Pont TM for its TFE-fluorocarbon resin



PLASTIC PRODUCTS DIVISION  
**RAYBESTOS-MANHATTAN, INC.**  
Manheim, Pa.

BIRMINGHAM 1 • CHICAGO 31 • CLEVELAND 16 • DALLAS 26 • DENVER 16 • DETROIT 2  
HOUSTON 1 • LOS ANGELES 58 • MINNEAPOLIS 16 • NEW ORLEANS 17 • PASSAIC • PHILADELPHIA 3  
PITTSBURGH 22 • SOUTH SAN FRANCISCO 5 • SEATTLE 4 • PETERBOROUGH, ONTARIO, CANADA

SPECIALISTS IN ASBESTOS, RUBBER, ENGINEERED PLASTICS, SINTERED METAL

For More Information Write No. 47 on Inquiry Card—Page 34

## Nylon Fuel Filter Gives Long Service



After two years of testing, Chrysler Corp. is installing nylon fuel filters on all its eight cylinder cars. Located between carburetor and fuel pump, filter is designed to end flooding caused by dirt and foreign particles in the fuel. Nylon gives long, maintenance-free service because it withstands high temperatures, continual vibration, and is unaffected by fuel and lubricants. The Spencer Chemical Co. is supplying heat stabilized Nylon 404 for molding filter housing.

Write No. 161 on Inquiry Card—Page 34

## Rectangular Boom Saves \$150 per Unit



Cost was cut \$150 per unit by the Asplundh Chipper Co., Chalfonte, Pa., when the structural form for the lower boom of their lift crane was changed from round to rectangular cross section. The tubing, made by Espro Tubing Div., Union Asbestos and Rubber Co., acts as both load bearing member and protective conduit for piping and controls. Valves, air lines, and cables for basket levelling system run inside.

Write No. 162 on Inquiry Card—Page 34

*consider*  
**BIW\***  
*as*  
*a quality*  
*producer*  
*of*  
*gray iron*  
*castings*

**B**  
**I**  
**W**



Quality is a closely guarded commodity at Brillion. Uniformity of quality, from casting to casting, from order to order, makes it even more valuable. The methods and equipment for the absolute control of all phases of production, starting with the base materials thru the final inspection of the finished casting, leaves nothing to chance. You can be assured of absolute uniform quality in each piece, in each order. Your reject problems are cut to the minimum — your production line can run smoothly.

**rillion**

On your next gray iron casting requirements, consider BIW\*. Write or call for further information on Brillion's quality story.

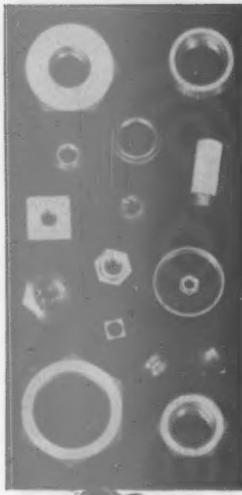
**B** BRILLION IRON WORKS, INC.  
BRILLION, WISCONSIN

For More Information Write No. 47 on Inquiry Card—Page 34



**Fischer**

**produces "specials" every day!**



When applied to precision nuts, "special" denotes more than just non-standard sizes, shapes and threads. It also means that advanced production facilities, specialized quality controls and extensive experience are necessary to produce and supply uniformly accurate custom nuts.

*With production records on more than 3,457 different types of special nuts . . . both brass and aluminum . . . Fischer is capable of mass producing turned nuts to your exact specifications. In fact, all Fischer nuts are made to closer tolerances than required by American Standard B18.2-1955 specifications.*

As the leading producer of turned nuts, Fischer also specializes in dependable "on schedule" deliveries and competitive pricing. Whatever your requirement, let Fischer quote on your next order for precision nuts . . . standards, specials or miniatures.



FOR DETAILS, WRITE FOR  
CATALOG FS-1000  
AND PRICE LISTS.

**Fischer**

**FISCHER SPECIAL MFG. CO.**

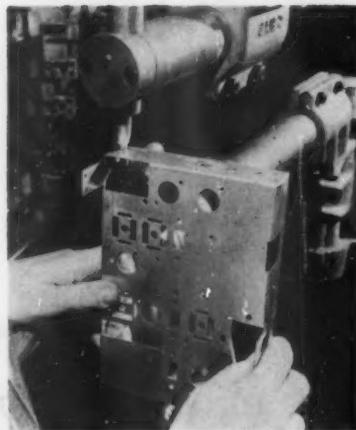
471 MORGAN STREET • CINCINNATI 6, OHIO

there's no premium for precision at

FS-1000

For More Information Write No. 49 on Inquiry Card—Page 34

### Tin Plate Simplifies Chassis Production



Blonder-Tongue Laboratories, Newark, N. J., has reduced processing costs and improved the quality of electronic chassis by fabricating them from heavy gage electrolytic tin coated steel. Formerly company used both cold rolled sheets and terne plate as chassis materials. Although tin plate costs more than cold rolled sheets, it eliminates the cost of three expensive plating operations needed for corrosion protection and to give a soldering base. Tin plate is supplied by Jones and Laughlin.

Write No. 163 on Inquiry Card—Page 34

### Easy Fittings Assembly Saves \$5000



The use of Weatherhead Ermeto fittings saved the Good Roads Machinery Corp., Minerva, Ohio, \$5000 on a single order. The company selected Ermeto fittings for all connections between hydraulic tubing and oil tanks, pumps, valves, and rams. Simple installation methods eliminated time and labor of pipe flaring and cost of flaring equipment.

Write No. 164 on Inquiry Card—Page 34

For More Information about ad on facing page  
Write No. 50 on Inquiry Card—pg. 34 →  
PURCHASING

*if cost reduction  
is your problem*

# value

# analysis

*dictates*

## NATIONAL HTM CASTINGS



To make or buy — to cast, forge or fabricate — that is often the question.

Before you decide, look into the advantages of National HTM (pearlitic malleable) castings over other methods of forming.

Among the great advantages of National HTM castings are closer as-cast tolerances that often eliminate machining operations . . . excellent response to subsequent hardening operations, either induction or flame . . . easy machinability on your present equipment . . . high ultimate strength . . . excellent non-seizing bearing qualities . . . air or liquid quenching . . . ability to be smooth-finished.

Yes, Value Analysis often makes the use of *National HTM castings a must*. And remember National HTM castings can be precision cast by the shell mold, CO<sub>2</sub> or green sand methods. Production costs tumble . . . performance and salability of your product spurt — with National HTM (pearlitic malleable) castings.

AA-2000

**NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY**  
*Established 1868*

The nation's largest independent producer of malleable and pearlitic malleable

MEMBER



### Important Physical Properties

Brinell	163 to 302*
Yield, psi	48,000 to 85,000*
Ultimate, psi	70,000 to 110,000*
Elongation, %	7 to 2*

\*Depending upon grade

# FELT

BY FELTERS

## PROVIDES DEPENDABLE, LOW-COST PARTS FOR **ELECTRIC MOTORS**

Seals . . . wicks . . . lubricators . . . washers . . . gaskets — are all vital electric motor parts that benefit from Felt by Felters.

A special Felters' "Engineered Fabrication" processes felt to specific thickness, density, hardness, and resiliency; and provides special characteristics such as absorption, stiffness, water repellency and flameproofing.

And, new felt and plastic laminates, called PlastiFelts, use synthetics such as Nylon, Teflon, Hycar and rubber to provide an even wider range of application, plus greatly improved performance.

These are some of the many electric motor applications where Felt by Felters offers both a low-cost and high performance material for non-metallic parts.



To get the most out of Felt, send for the Felters Design Book — a complete digest on properties and applications. Write, today.

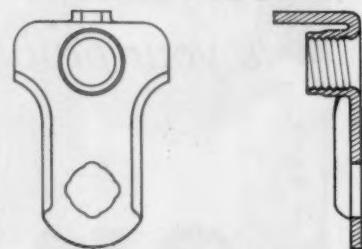
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**The FELTERS Co.**

239 SOUTH STREET  
BOSTON 11, MASSACHUSETTS

Pioneer Producers of Felt and Synthetic Non-Woven Fabrics  
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### Three-piece Assembly Reduced to One



A stronger and less costly part resulted when a portion of a thermostat control unit was redesigned from an assembly of three pieces to a one-piece sheet metal component. Originally made of a steel plate, lug, and special hex nut welded together, the one-piece design is drawn and formed from .055" thick steel. Except for tapping, component is made in one operation on a multiple plunger press by the Risdon Mfg. Co., Naugatuck, Conn.

Write No. 165 on Inquiry Card—Page 34

### Gray Iron Reduces Cost from 97¢ to 21¢



A reduction in cost of over 78% was realized by Hotpoint, Berwyn, Ill., in substituting a gray iron casting for a welded strike plate for a high compression steam cooker door. The part was originally made from 18-8 stainless steel. By reducing the parts in the assembly from three to one, malfunction from tolerance buildup was also materially reduced.

Write No. 166 on Inquiry Card—Page 34

### Less Machining With Extruded Stock

Welch, Inc., Waukegan, Ill., has achieved lower production costs by substituting Anaconda extruded shapes in fabricating lock parts

(Please turn to page 140)

## SEAMLESS

- Long radius or short—the finest elbows ever made . . . hot coined for dimensional accuracy from end to end.
- Forged at controlled heat for superior metallurgical quality.
- Specially machined ends for quickest fit-up and welding.
- Ells, tees, returns—all types of fittings—available in seamless through 24".
- Produced by newest, most modern equipment, combined with latest technology in forging, sizing, heat-treating and machining.



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STOCKING DISTRIBUTORS  
FROM COAST TO COAST

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- Especially suited for Long Tangent bonus elbows, reducing ell, and special fittings of unusual shapes.
- Stocked in carbon steel, wrot iron, chrome-moly . . . available in Hi-Yield and all other weldable metals.
- Wall thicknesses up to 4"—or more.
- Delivery from stock—with or without Long Tangents—in all sizes through 36"; to order, through 48".

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PIPING COMPANY, INC.  
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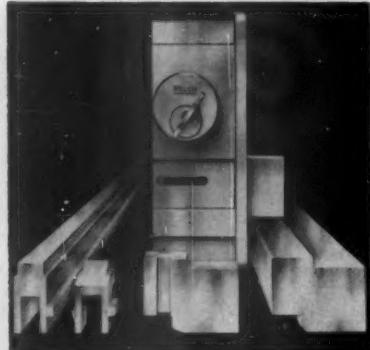
For More Information Write No. 52 on Inquiry Card—Page 34

MAY 23, 1960

139

(Continued from page 138)

which were formerly made from bar stock. Now, new lock mechanisms are built around parts which can be cut by a metal



## SPECIAL RIVETS

like some of the samples shown here . . . or the more commonly used tubular and split rivets . . . they're all alike to the American Rivet Co. And always—our own special brand of quality and service that gets you what you want when you want it.

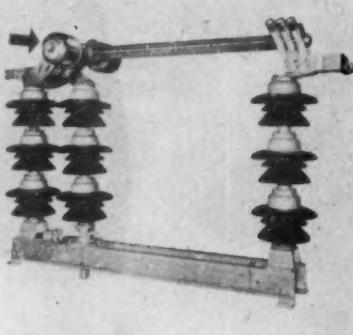
**THE AMERICAN RIVET CO., Inc.**  
849 N. Kedzie Ave., Chicago 51, Ill.

Write for price list. For specials, send specifications for prices.

## BUY AMERICAN *Tubular and Split RIVETS*

For More Information Write No. 53 on Inquiry Card—Page 34

### Material, Labor Costs Cut by Aluminum Spinning



Less material and labor costs on metal housings for counter balance springs of high voltage switches were effected by the Delta-Star Div., H. K. Porter & Co., Chicago, Ill. Formerly made of a copper spinning for \$3.35 each plus 10¢ for cleaning, the housings are now made of an aluminum spinning, copper anodized, at a total cost of \$1.75.

Write No. 167 on Inquiry Card—Page 31

## PENNY-WISE PROTECTION FOR YOUR PRODUCT

Whether you make insect sprayers or clothes washers, lawn sprinklers or car washers, they'll be more trouble-free if protected from sand, dirt, scale, rust, pipe chips, and insects by an inexpensive, easily replaceable filter washer in the hose connection. Vinyl sealing washer is permanently bonded to monel, brass, or tin-coat wire cloth strainer. One size fits all standard garden hose couplings, seals perfectly with finger tightening. Available with 20, 30, 40, 50, 60, and 100-mesh strainers. Call Federal 9-7088 or write:

**Ron-Vik, Inc.**

1352 N.E. Quincy St., Minneapolis 13, Minn.

Washers

Nozzles

Sprinklers

Washers

For More Information Write No. 54 on Inquiry Card—Page 34

FOR  
READER SERVICE CARD  
TURN TO  
PAGE 34



## CIRCLES

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WHEEL DISCS by Brown-Lipe-Chapin round out the beauty of today's outstanding automobiles. And your product can also benefit from this lasting sales appeal with the facilities of B-L-C. Whether it is eye-catching appeal, lustrous rugged protection or a light metal border to brighten your sales appeal, we offer you our services backed by years of experience and research. Formed metal parts . . . pressed, rolled, stretch bent or die-cast, can be polished, chrome plated, anodized or painted for you in either of our plants at Elyria, Ohio, or Syracuse, New York. Let our engineers help you right at the design stage to combine beauty and economy in brightening your product. They'll follow your job every step of the way. For prompt attention, call or write Brown-Lipe-Chapin, Syracuse, New York.



# RELIABILITY by BROWN-LIPE-CHAPIN

DIVISION OF GENERAL MOTORS CORPORATION

For More Information Write No. 55 on Inquiry Card—Page 34



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**T-J CYLINDER**  
 That Can Assure  
Accurate Efficient Operation

Only T-J's complete line can assure you a cylinder of either air or hydraulic application—with practically limitless design specifications for bore, stroke, pressure range and even delivery requirement. From the time-tested, standard tie-rod air and hydraulic, to the exclusive T-J Spacemaker, and including the recently introduced Squair Head, T-J cylinders give you more features for efficient, long-lasting operation. Write today!

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hydraulic cylinders.



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**SM-56-3** for the incomparable  
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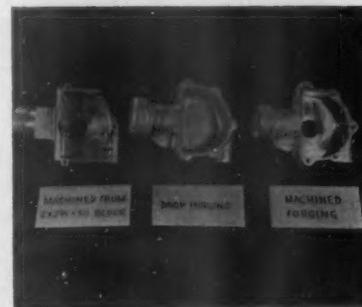
**HSM5-58-4** for the High-  
Pressure Hydraulic  
Spacemaker cylinder.

**THE TOMKINS-JOHNSON CO., JACKSON, MICH.**

CYLINDERS • MILLING CUTTERS • RIVETERS and CLINCHERS

For More Information Write No. 56 on Inquiry Card—Page 34

**Labor Cost Cut 60%  
By Drop Forging**



Less machining time and lower labor costs were achieved by Marotta Valve Corp., Boonton, N.J., after switching to drop forgings in producing valve components. The aluminum drop forged part, furnished by Merrill Bros., Maspeth, N.Y., saved two hours machine time per unit and improved both quality and appearance of finished product.

Write No. 169 on Inquiry Card—Page 34

**Circular Forging  
Cuts Gear Cost**



The Koehring Co., Milwaukee, Wis., previously machined this gear from a cast gear blank. Now they make it from an impression-die steel forging supplied by the Bethlehem Steel Co. First cost saving is \$29.24. Additional saving of \$6.00 per piece is realized in machining—turning, boring, facing, and hobbing teeth.

Write No. 170 on Inquiry Card—Page 34

**Semi-Tubular Rivets  
Reduce Costs by \$20,000**

Savings in parts cost and assembly time were achieved by the Royal McBee Corp., Hartford,

(Please turn to page 144)

For More Information about ad on facing  
page Write No. 57 on Inquiry Card—pg. 34→

PURCHASING



## Ever see anything so versatile as **LAMINUM®**?

Generally, laminated shims of LAMINUM are custom stamped to blueprint specifications. Because the laminations are so easily p-e-e-l-e-d to bring the shims down to desired thickness, LAMINUM shims are used universally on assembly lines where they save time and cut costs.

But occasionally you run into a special situation—the need for a shim of *varying* thickness, for example. LAMINUM solves that problem with cost cutting ease. As illustrated, the shim is scored into quarters. Then layers are p-e-e-l-e-d from the

quarters so as to come up with varying thicknesses to correspond with variations in the job at hand.

That's LAMINUM! It's fast. Practical. Precise. No need for stand-by equipment. No machining. No grinding. No counting. No stacking. No mixing. And no grit between layers—ever.

For quick estimates and service, send your prints to the Laminated Shim Company, Inc., West Coast Sales and Service 600 Sixteenth St., Oakland 12, Calif. \* Home Office and Plant 2405 Union St., Glenbrook, Conn.



LAMINUM is the registered trade name for Laminated Shims with layers completely surface bonded to look and act like solid metal. Design Folder No. 3 contains all facts and engineering data. Send for it.

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# NEW NYLAFLOW®

## Pressure Hose

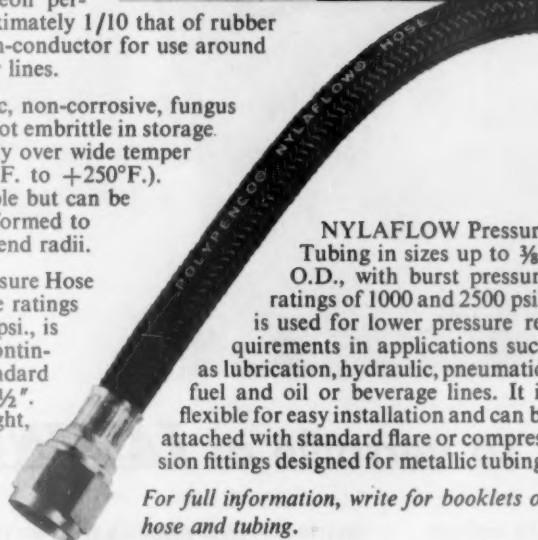
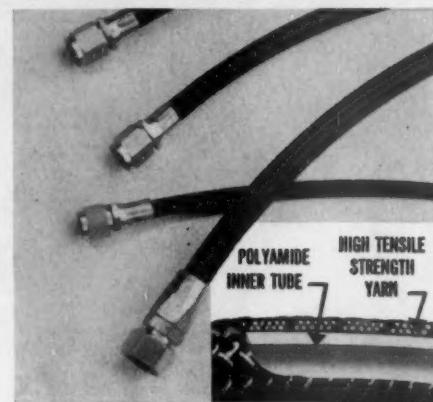
*One-fifth the weight and Outperforms  
Rubber Hose of Equivalent Burst Strength*

• A specially formulated nylon inner tube reinforced with high tensile yarn and abrasion resistant cover\*, make new NYLAFLOW pressure hose ideal for jobs requiring exceptional resistance to flex, pressure pulse and vibrational fatigue.

It is unaffected by flammable and non-flammable hydraulic fluids, hydrazine and other rocket fuels, and has excellent resistance to caustics and almost all organic solvents. Freon permeability is approximately 1/10 that of rubber hose. Excellent non-conductor for use around high voltage power lines.

Odorless, non-toxic, non-corrosive, fungus resistant and will not embrittle in storage. Functions efficiently over wide temperature range (-65°F. to +250°F.). Remains form stable but can be permanently heat-formed to small, stress-free bend radii.

NYLAFLOW Pressure Hose with burst pressure ratings of 5000 and 8000 psi., is available in long continuous lengths in standard diameters up to  $\frac{1}{2}$ ". Compact, lightweight, reusable fittings and assemblies are also available.



*For full information, write for booklets on hose and tubing.*

\*Patented

**The Polymer Corporation of Penna.**  
Reading, Pa.



For More Information Write No. 58 on Inquiry Card—Page 34

(Continued from page 142)

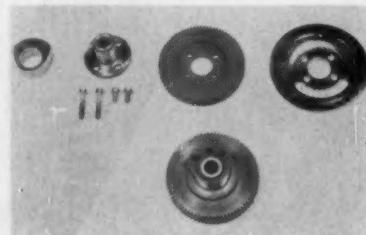
Conn., after switching from solid rivets to semi-tubular rivets in fastening a typewriter subassembly. Three countersunk holes were eliminated as well as hand



work to transfer loose assembly to a spinning machine for fastening. The Tubular Rivet & Stud Co. designed the rivets and the loading fixture for fastening on an automatic riveter.

Write No. 171 on Inquiry Card—Page 34

### Fibre Cam Replaces Eight-Piece Assembly



Savings of over 90% over previous materials are reported by the manufacturer of a 16mm movie projector in using a one-piece cam produced by the Amplex Division of Chrysler Corp. Made of Oiltite No. 9, the combination gear and compound cam replaces eight pieces which formerly made up the assembly. In addition to eliminating assembly time, the new cam has reduced wear in the projector and provided more quiet operation.

Write No. 172 on Inquiry Card—Page 34

### Renewable-Seat Valves Solve Corrosion Problem

Valves on the chemical feed connections at boiler feed pumps at the Torrington Co., Torrington, Conn., are subject to a pressure

(Please turn to page 147)



INT TO CANTON  
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SHIP TO JAPAN  
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AMERICA'S MOST COMPLETE LINE OF INDUSTRIAL FASTENERS

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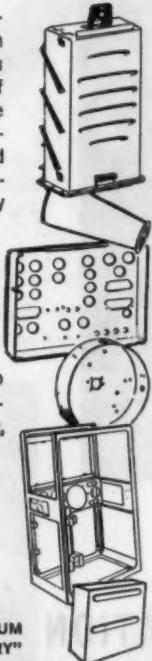
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Special shapes or standard, rigid or flexible, in diameters from  $\frac{1}{2}$ " to 16". Our engineers have developed advanced techniques that can save time and money on the right shape for your specific needs.



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We extrude any shape in a variety of formulations to meet a wide range of design and performance requirements. Our complete tool and die shop is staffed with skilled technicians. We maintain a library of more than 400 section dies, one of which may fit your product design.



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We shape, flatten, curve, swedge, drill and perform other fabricating operations to make plastic parts ready for your production lines. Close tolerance, absolute uniformity, dimensional stability and high-gloss finish are standard production requirements at Yardley.

Write for Bulletin 180 — and for  
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**YARDLEY PLASTICS CO.**

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PURCHASING

(Continued from page 144)

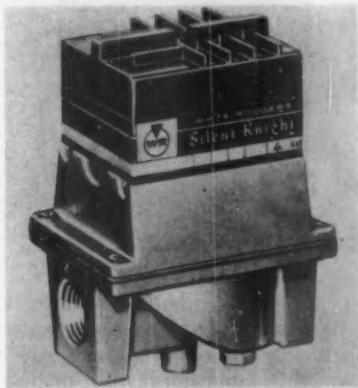
of 140 lbs. Prior to the installation of Fairbanks renewable seat bronze gate valves it was necessary to replace the valves every



two years, as chemical treatment material deteriorated seats and wedges so they no longer held tight. Renewable seat valves are still tight after four years service.

Write No. 173 on Inquiry Card—Page 34

**Silicone Oil  
Improves Valve Action**



By using a Union Carbide silicone oil as a damping fluid, the White-Rodgers Co., St. Louis, Mo., has been able to develop a gas valve that does not hammer or pop when turned on by remote control. The oil slows down the operating action of the valve and eases the parts together gently. Silicone oil is not affected by heat and cold and provides consistent operation over a wide range of temperature.

Write No. 174 on Inquiry Card—Page 34

MAY 23, 1960



Men who know and specify special fasteners depend on this familiar symbol . . . CP . . . the famous Chandler hallmark for precision and reliability in fasteners. It's your guarantee that each fastener meets the rigorous materials and performance tests required by industrial and military standards. Before placing your next order . . .

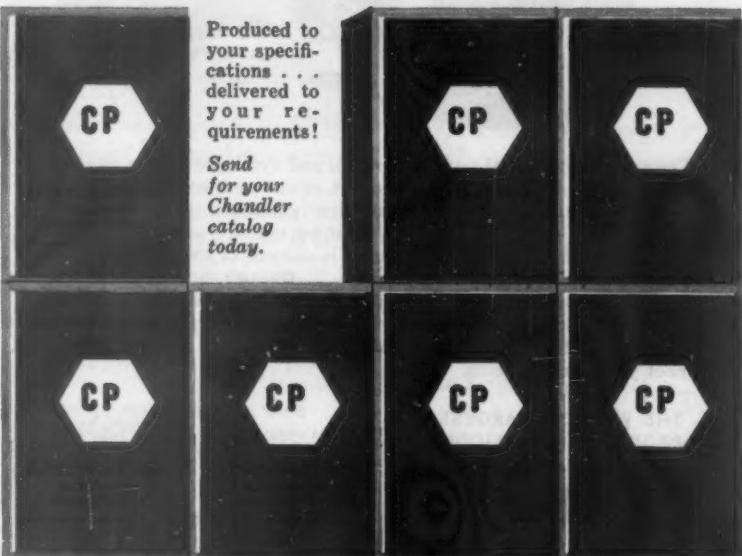
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Produced to  
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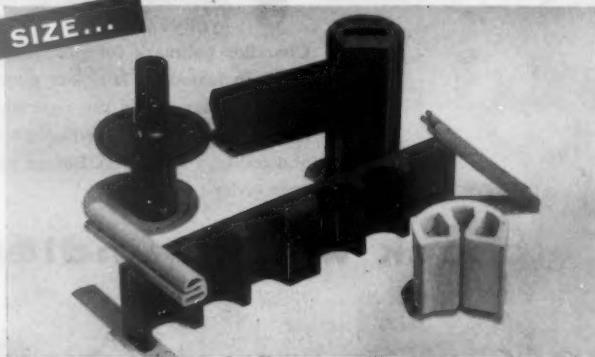
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today.*



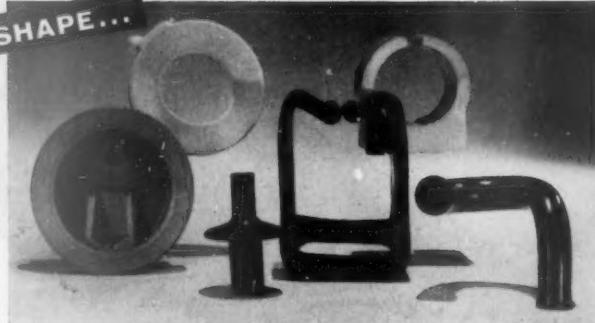
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For More Information Write No. 62 on Inquiry Card—Page 34

# STALWART PRODUCES PRECISION CUSTOM RUBBER PARTS TO YOUR EXACT SPECIFICATIONS

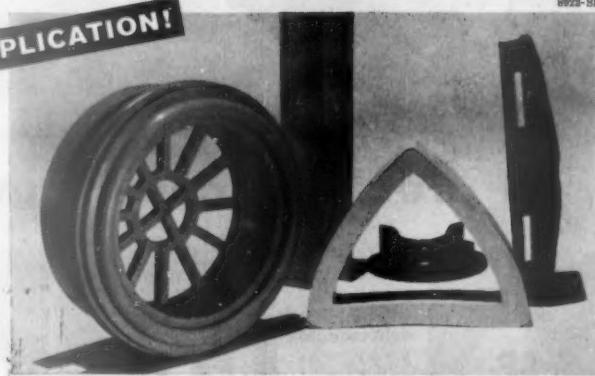
ANY SIZE...



ANY SHAPE...



ANY APPLICATION!



Compounded from all types of natural and synthetic rubber, Stalwart custom parts are molded, extruded, cut, calendered, sponged or spliced to meet the most exacting performance requirements . . . as well as all standard specifications established by military and industrial organizations. Every Stalwart customer is assured of the highest quality plus important production economies . . . through modern production facilities, advanced compounding techniques and extensive testing facilities. Write us today about your special rubber parts problem or check with Stalwart's Plastics Division for injection molded parts to meet your requirements.

THE WORLD'S LARGEST PRODUCER OF SILICONE CUSTOM RUBBER PARTS

**STALWART**  
RUBBER COMPANY

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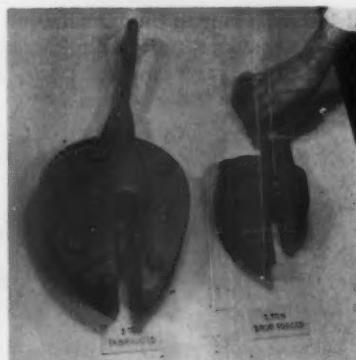
148

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162 Northfield Road  
Bedford, Ohio  
Subsidiaries: Jasper Rubber Company  
Warren Molded Plastics, Inc.



## Drop Forgings Cut Weight and Bulk in Half



These two clamps for lifting steel plate, made by Merrill Bros., Maspeth, N.Y., are both three ton capacity. The large one is stamped from steel plate; the small one drop forged of 1045 steel and heat treated. Weight is cut from 47 $\frac{3}{4}$  lbs. to 20 $\frac{1}{2}$  lbs., and safety factor increased from 3 to 1, to 5 to 1. Drop forging also improves quality of metal.

Write No. 175 on Inquiry Card—Page 34

## Manufacturing Cost Cut 40% by Welded Design



Welded design reduced manufacturing costs 40% on a 3 x 8" two roll laboratory mill manufactured by William R. Thropp & Sons, Lyndhurst, N.J. Desirable features of compactness and light weight were achieved by reducing floor area requirements by 30% and weight by 18%.

Write No. 176 on Inquiry Card—Page 34

## Press Increases Fastener Production Ten Times

Rosan Inc., Newport Beach, Calif., has increased production of fastener assemblies from 250 to

(Please turn to page 150)

PURCHASING



## DO YOUR MOLDED COMPONENTS GIVE YOU HEADACHES?

Compound dilemmas? Should it be Neoprene . . . Buna-N . . . VITON® . . . Silicon or Polyacrylic? How about temperature . . . below zero or sizzling? Unusual pressure conditions? . . . or perhaps a highly destructive hydraulic fluid?

If compound . . . temperature . . . pressure or the medium bring unusual problems to your drawing board call on IPC. Our "custom" approach to *your* application is strengthened by broad experience in the use of materials and molding techniques.

Strict attention to detail is an IPC hallmark. We welcome problem solving. Ask your IPC representative to show you samples of some unusual headaches we've cured.



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For More Information Write No. 64 on Inquiry Card—Page 34

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**because buying  
the BEST is  
YOUR business**



## ABBOTT BALL BULLETIN

Send for your copy of new Abbott Bulletin AP-1 . . . it provides up-to-date details on the adaptable, reliable products of the world's leading producer of bearing balls and burnishing media.

Included is important tabular information on conversion of old Abbott standard ball nomenclature to the new, simplified AFBMA\* nomenclature. Also presented is useful new selection information on the Abbott lines of steel burnishing media and soft-headed decorative balls and shapes. Fill out the coupon below and mail it today.

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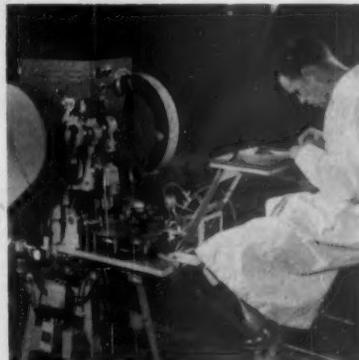
**THE ABBOTT BALL  
COMPANY**

16 RAILROAD AVE • HARTFORD 10, CONN.

For More Information Write No. 65  
on Inquiry Card—Page 34

(Continued from page 148)

2500 per hour using a 15-ton Kenco Electro-Safe press. The two fastener parts are automatically fed from separate hoppers to a 12



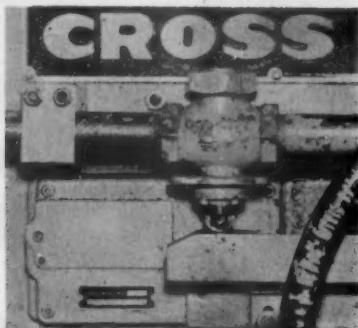
station dial feed table. Controls are interlocked with checking devices which monitor proper function at dial stations.

Write No. 177 on Inquiry Card—Page 34

### Less Down Time With Pretested Valve

By using Airmatic cam operated valves to control the flow of

coolants in its transfer machines, the Cross Co., Detroit, Mich., has eliminated frequent maintenance and costly down time. Valves re-



place lever-operated globe valves in which frequent stem operation caused packing wear and resulting leakage. Cross tested valves for 200,000 cycles before making decision.

Write No. 178 on Inquiry Card—Page 34

### Die Bank Components Cut Wheel Cover Cost 69%

To protect the mechanism of American Coleman Co.'s aircraft towing tractor against possible (Please turn to page 152)

## NUTS BOLTS SCREWS WASHERS

### Easy on the eye

attractive  
package  
facilitates  
both stocking  
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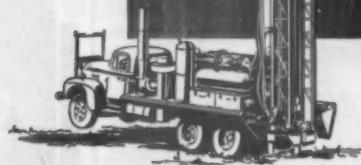
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**THE KEY  
TO A  
DEPENDABLE  
SYSTEM!**

**Eastman**  
**HYDRAULIC HOSE ASSEMBLIES**

**EASTMAN**  
designs complete  
hydraulic operation  
for SCHRAMM  
Rotadrill



Valves mounted in three convenient banks for each outrigger, forward and reverse rotation of motor, slow down speed, rapid down speed and for breakout cylinder.

The cooperation of EASTMAN Engineering was enlisted in making the operation of this truck-mounted Schramm Rotadrill completely *hydraulic*.

Hydraulic power is delivered through EASTMAN Hydraulic Hose Assemblies to:

1. Three-Speed Reversible Rotation Head: Standard speeds—44, 65 and 120 r.p.m. with 26,500 inch pounds torque.
2. Cylinders controlling down feed, rapid feed and slow feed.
3. Controls for raising and lowering of mast.
4. Breakout Cylinder.
5. Hydraulic Winch and Hook.
6. Three Outriggers.

Dependable field service is assured through EASTMAN Two-Wire Braid High Pressure Hose with Permanently Attached Couplings providing a bond stronger than the hose itself.

*Efficient power delivery through the extensive, multiple circuits of this rock-drilling rig is obtained through EASTMAN designed permanently attached hose assemblies which insure longer life and lower cost.*

**ENGINEERED FOR ENGINEERS BY ENGINEERS**

Let EASTMAN Engineering assist you in planning the initial layout of your hydraulic system—for most efficient power delivery and lowest cost.

**Eastman** MANUFACTURING COMPANY  
Dept. PM-5, MANITOWOC, WISCONSIN

For More Information Write No. 67 on Inquiry Card—Page 34

MAY 23, 1960



PERMANENTLY ATTACHED COUPLINGS  
for 1, 2, and 3 wire braid rubber cover hose



REUSABLE COUPLINGS  
for fabric cover hose



REUSABLE COUPLINGS  
for rubber cover hose



CLAMP COUPLINGS  
for 1, 2, and 3 wire braid rubber cover hose



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Bulletin 100 and  
200 on EASTMAN  
High, Medium and  
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Phone: AVenue 2-3232 TWX CG 3185West Coast Division - Office and Warehouse  
5822 West Washington Blvd., Culver City, Calif.  
Phone: WEbster 3-9595 TWX LA 1472For More Information Write No. 68  
on Inquiry Card—Page 34

152

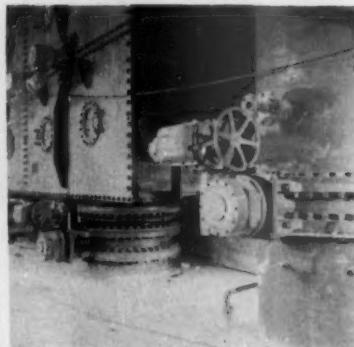
damage from stones and debris, a wheel cover was required. Formerly produced as a machined, malleable iron casting, cover cost



\$8.49 plus pattern charge. By switching to Commercial Shearing and Stamping Co.'s die bank, user obtained custom stamped component at a unit cost of \$2.59.

Write No. 179 on Inquiry Card—Page 34

### Valves Conserve Power Plant Space



The Potomac Electric Co. is benefitting from space savings of up to 30% by using butterfly valves at its Dickerson, Md., generating station. The smaller, lighter Allis Chalmers butterfly valves are used in place of gate valves. They also resist corrosion because natural rubber seats and smooth bronze discs are used in their construction.

Write No. 180 on Inquiry Card—Page 34

**For a Complete Report  
On the 45th Annual  
N.A.P.A. Convention  
Don't Miss the June 20th  
Issue of  
PURCHASING Magazine**

many Rubber Companies  
make Rubber Hose but...

only  
**Republic Rubber**  
makes  
**CONDUCTALL**

*the  
General-  
Purpose  
Hose...*



saves  
buying and  
stocking  
many  
kinds of  
hose!

**REPUBLIC  
RUBBER**

DIVISION LEE RUBBER & TIRE CORP.  
YOUNGSTOWN, OHIO

Nylon Finish Sheet  
Packing Too! Write  
Dept. D.

For More Information Write No. 69  
on Inquiry Card—Page 34  
**PURCHASING**



## THOMSON RIVETS offer faster assembly ... greater strength . . . improved performance

**Cost-and-method analyses prove that rivets**, teamed with automatic rivet-setting machines, cut costs, speed assembly, provide more dependable fastening. That's why auto makers and their suppliers specify rivets on over 500 assembly points on today's models.

**75 years' experience** in solving fastening problems is the plus you get when J. L. Thomson Mfg. Co. becomes your source of rivets and machines. With over 8000 rivet specifications and more than 200 rivet setting machine models, Thomson is your authoritative source for fastening help.



**Write for "Cost Cutting Facts About Fastening With Rivets"**, a new, complete digest of up-to-date information on rivets and automatic machines. The coupon at right, attached to your company's letterhead, will bring it to you quickly. For more immediate problems, get in touch with your nearby Thomson Fastening Man. He's listed in the Yellow Pages.

*If you plan to attend the Design Engineering Show see us at booth 625*

NEW YORK • ILLINOIS • INDIANA • OHIO • MICH. • PENN. • CALIF. • FLA. • TEXAS • S. CAROLINA • MISSOURI

*Thomson Rivets cut costs for such products as BRAKES, CLUTCHES, DISTRIBUTORS, SWITCHES, RADIOS, CARBUREATORS, WINDOW LIFTS, BODY ASSEMBLIES, and hundreds of other automotive fastening jobs from radiator grills to gas tank caps.*



Judson L. Thomson Mfg. Co., 521 Sawyer Rd., Waltham, Mass.

- Please rush your new handbook "Cost Cutting Facts About Fastening With Rivets"
- Name \_\_\_\_\_ Title \_\_\_\_\_
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For More Information Write No. 70 on Inquiry Card—Page 34

**What  
does this  
symbol  
mean?**



*If you're responsible for purchasing heat and corrosion resistant castings, this symbol is important ...*

*... It identifies the Alloy Casting Institute and its members, who have supported twenty-five years of continuous technical research ... research that has resulted in dependable alloy castings for critical service requirements.*

*Can your supplier give you the benefits of this up-to-date research? It will pay you to investigate.*



**ALLOY CASTING INSTITUTE**

1001 Franklin Ave./Garden City, New York

...For technical information on corrosion resistant and heat resistant castings

May we send you  
"How to Buy High Alloy  
Castings" and the 1960  
List of Alloy Designations?  
Both free for the asking.

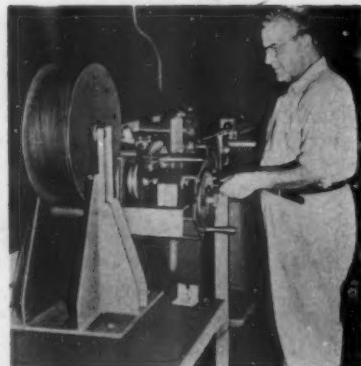
For More Information Write No. 71 on Inquiry Card—Page 34

**Flexible Shelving  
Pays Off For Ford**



Fast-adjusting steel shelving is paying off at Ford Motor Company's new automatic transmission plant at Sharonville, Pa. The shelving is used in the main stores area and in eight individual expense stores cribs. It permits storekeepers to raise, lower or remove a shelf in seconds. This is an important improvement since Ford changes 40% or more of its stocks at this plant each year. The easily adjustable shelving streamlines the dozens of shelving rearrangements that must be made each day. It also eliminates the necessity of leaving 15% of the shelves empty, on standby, in case of sudden need. Write No. 256 on Inquiry Card—Page 34

**Extra-Long Tubing Cuts  
Assembly Time 33%**



Brown Instruments has cut the time it takes to feed capillary tubing into flexible metal hose covering by one-third. Its tubing feeder can handle almost any length but the shorter the length the more frequently the machine must be set up. So Brown went

(Please turn to page 156)

For More Information about ad on facing page Write No. 72 on Inquiry Card—pg. 34→

PURCHASING

**CUT  
YOUR  
FASTENING  
COST...**

*where it matters most!*

\*Studies have shown that the cost of applying a fastener is more than four times the cost of the fastener itself.

For each \$1,000 you spend for fasteners, you're probably investing AN EXTRA \$4,000\* to install those same fasteners! Shakeproof has found the most effective way to reduce this major part of assembly cost . . . on-the-line engineering.

**WHAT IS SHAKEPROOF ON-THE-LINE ENGINEERING?**

In your plant, out on the line, a Shakeproof idea engineer carefully studies an assembly operation. By watching, asking and listening, he uncovers fastening problems or areas where product performance can be improved through improved fastening techniques. He then applies his specialized knowledge of fasteners and assembly methods to simplify and improve both the product and assembly operation. He might recommend one of the broad line of Shakeproof fasteners to solve the problem or to increase product efficiency. Or, if greater economies and improved product performance can be achieved with a special-purpose fastener, he will design a Shakeproof product specifically for your application. In either case, the Shakeproof idea engineer will provide you with samples to use and test in your own plant.

Arrange for a Shakeproof idea engineer to visit your plant soon. Discover how Shakeproof On-the-Line Engineering can help cut your fastening cost . . . where it matters most!



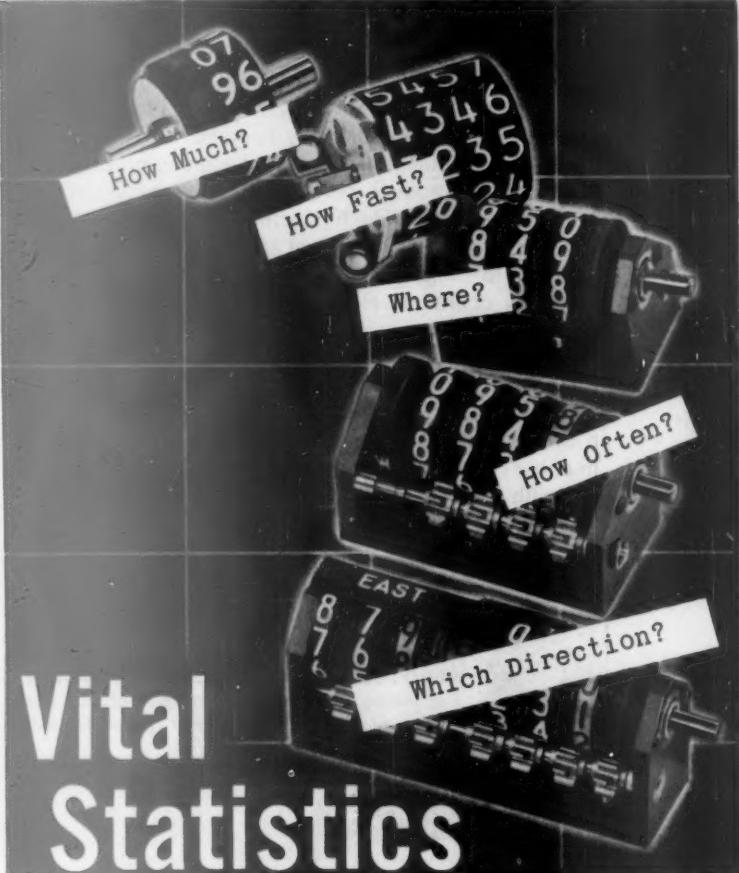
**SEND FOR THIS FREE BOOKLET** "On-the-Line Engineering" gives specific examples of time and money saving Shakeproof fastener applications and offers free samples.



*Look to Shakeproof—the Leader in Fastening.*

**SHAKEPROOF**  
"FASTENING HEADQUARTERS"®  
**DIVISION OF ILLINOIS TOOL WORKS**  
St. Charles Road, Elgin, Illinois  
In Canada: Shakeproof/Fastex  
Division of Canada Illinois Tools Limited, 67 Scarsdale Road, Don Mills, Ontario

**OPERATION READOUT... one of a series**



# Vital Statistics for the Balance Sheet

Readout is the new concept in counting that cuts costs and improves production through digital communications. It can register vital statistics about every nook and cranny of your business . . . how much? how often? when? how fast? where? how long? which direction? what position? As original equipment, Readout makes your product perform better. Installed on machines in office or plant, Readout controls and records — provide answers to all these questions.

#### Take advantage of Veeder-Root's "Operation Readout"

Whatever your indication, counting or readout problem, Veeder-Root can give you the best possible solution — without wasted time or engineering effort on your part. If you do not have the complete Veeder-Root catalog, write for your copy today; or contact your local Veeder-Root Counting Engineer.

#### Veeder-Root Readout SPECIAL



Series 1268. New 6-figure, non reset Electromagnetic Counter features low cost, rugged reliability and compact size. Base or panel mounting, 700 counts per minute. Used for vending machines, tallying relay cycles, remote indication, to name a few.

**Veeder-Root**  
HARTFORD 2, CONNECTICUT  
*'The Name that Counts'*

New York • Chicago • Los Angeles • San Francisco • Seattle  
St. Louis • Greenville, S. C. • Altoona, Pa. • Montreal  
Offices and Agents in other principal cities

For More Information Write No. 73 on Inquiry Card—Page 34

(Continued from page 154)

to Superior Tube Co., their tubing supplier, and asked that tubing be furnished in extra long lengths. This not only speeded up assembly but also cut scrap losses. For example, 14 tubes, each 35 feet long can be cut from a 500 ft. length of tubing with a 10-foot short end remaining. But only two 35-foot pieces can be cut from a 100-ft. length with a potential scrap loss of 35 ft.

Write No. 257 on Inquiry Card—Page 34

#### Blade Life Up 4700%



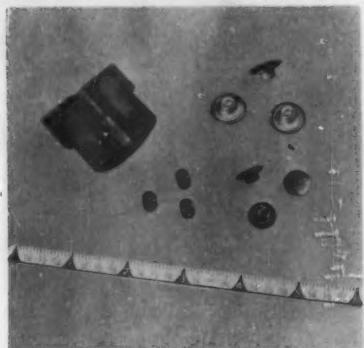
Alloy blades used to trim bamboo in the production of fishing rods are lasting 48 times longer than conventional high-speed-steel blades previously used. Charles F. Orvis Company, Manchester, Vermont, has standardized on the use of "Haynes Stellite" Star J-Metal for this particular job. New blades last a full 24 hours, where old ones had to be changed every 30 minutes causing 48 work stoppages each full day.

Write No. 258 on Inquiry Card—Page 34

#### New Die Steel Doubles Slug Die Output

Universal Button Co. had been using a high carbon, high chromium die steel for a slug die forming the inside part of a fabric button from A.I.S.I. 1010 cold drawn .225-in. dia. wire. However, inconsistent centerline quality of the steel shortened the die's life to about 35,000 pieces under this severe wear-shock application. The company began using Carpenter H-9 Double

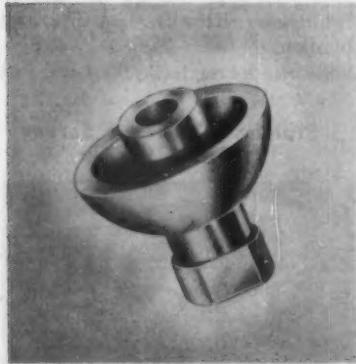
Header, a deep-hardening die steel made specifically for cold header application where internal defects cannot be tolerated. H-9 Double Header is produced by



The Carpenter Steel Co.'s Mel-Trol process, a new quality control system with patented ingot mold. Now, Universal Button gets 80,000 pieces from each die at greatly reduced tool cost. Die cost was further reduced by use of a flush quench fixture which permitted the company to heat treat its own tools at a cost 300% below that of a commercial heat treating company.

Write No. 259 on Inquiry Card—Page 34

#### Less Scrap From Automatic Zinc Die Castings



Precision zinc alloy die castings produced by high-speed, automatic techniques have helped a manufacturer reduce costs and get a better part. For example, the cost of die cast swivels for rear-view mirrors was cut from five cents to one cent. Reason for the cost reduction is that with automatic zinc die casting scrap loss was reduced markedly and machining operations were eliminated.

Write No. 260 on Inquiry Card—Page 34  
For More Information Write No. 74  
on Inquiry Card—Page 34→

MAY 23, 1960

It would take you over three months to walk past Harper's complete stock of corrosion-resistant fastenings...

Harper manufactures and maintains the world's largest stock of standard and non-standard fasteners in Stainless Steel, Brass, Monel, Silicon Bronze, Naval Bronze, Aluminum, Copper, Titanium, and other corrosion-resistant alloys. Harper's operation is complete—from elements, billets and extruding to rolling and fabricating parts—uniform quality control that assures you of the finest parts that money can buy, yet includes the economies that only an integrated operation can realize. This is another important difference that separates Harper from other fastener companies all over the world. Harper distributors everywhere maintain complete stocks for immediate delivery. See your Yellow Pages.

Write for your free copy of new, factual, informative 24-page "CORROSION GUIDE."



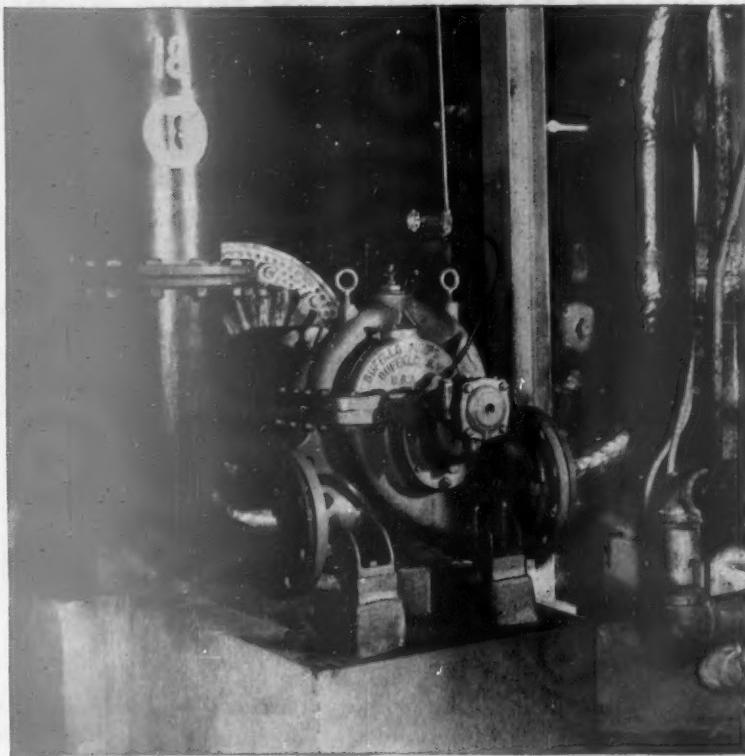
THE H. M. HARPER COMPANY  
8210 Lehigh Avenue • Morton Grove, Illinois



ANOTHER BIG HARPER

Difference!





## 'BUFFALO' TAKES THE MYSTERY OUT OF PUMP SELECTION!

You don't have to hold a degree in Doctor of Pumps to select the best pump for the job! Start with a manufacturer you can rely on, and one who offers a complete line of pumps engineered to specific applications. Pick a manufacturer who is known for quality and reliability.

Take the 'Buffalo' Double Suction Pump pictured above. It's the only logical choice where you want the most efficient pumping of clear water in capacities from 10 to 14,000 gallons per minute. There's no mystery about it. Simply formed passageways, near perfect hydraulic balance, full ball bearing support on both guide and thrust bearings—lifetime construction throughout plus complete accessibility of all parts are built into this superb pump.

For chemical liquids—"Buffalo" builds a pump tailored to the job.

Paper stocks? Boiler feed? Air conditioning service? Again, special job-designed 'Buffalo' Pumps await your selection. Just call your nearby 'Buffalo' Engineering Representative for full details and recommendations—or write us.



### BUFFALO PUMPS

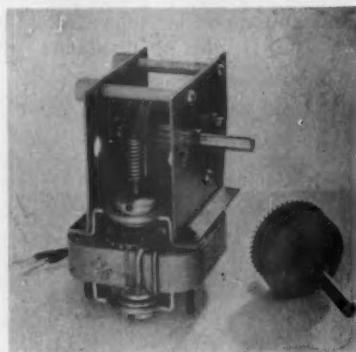
Division of Buffalo Forge Co.  
143 MORTIMER ST. • BUFFALO, N.Y.

Canada Pumps Ltd., Kitchener, Ontario  
Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

For More Information Write No. 75 on Inquiry Card—Page 34

Switch to Costlier Laminate Cuts Cost 18%



Sometimes, purchase of the more expensive material opens entirely new avenues to cost-cutting. Brevel Products Corp. saved 18% on the purchase price of laminated plastic gear blanks by changing from a Grade C (canvas-base) laminate gear blank to Grade L, a more expensive, cotton-linen base phenolic. When Grade C was used, the laminate supplier, Taylor Fibre Co., had to saw blanks, leaving extra trim, in order to meet Brevel's tolerance requirements. Grade L, while it costs more, can be punched into gear blanks, with no problem of holding tolerances and with less subsequent cleanup required. Result: lower cost blanks.

Write No. 261 on Inquiry Card—Page 34

### Stainless Conveyor Serves 24 Times Longer

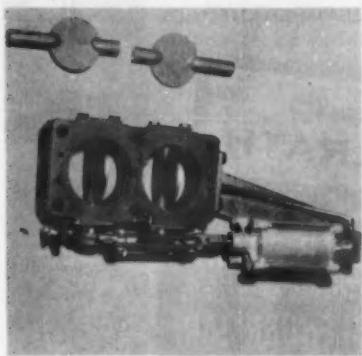


Stainless steel conveyors for handling bulk materials can outlast those of other metals by four to one or better. Even under mildly severe service conditions, cost of stainless equipment often is lowest. In more severe environments, stainless can become the only economic material of construction. At A. W. Metals Company, Chicago, lead is reclaimed

from storage batteries. Each of four metal conveyors there deteriorated from sulphuric acid corrosion within one year. To lower replacement costs and decrease downtime, a 35-foot-long conveyor made of austenitic stainless steel was installed and after more than six years remains in continuous service. A daily water sluice and a weekly steam cleaning keeps the stainless conveyor free of corrosion.

Write No. 262 on Inquiry Card—Page 34

**High Alloy Shell Moldings Cut Fabricating Costs**

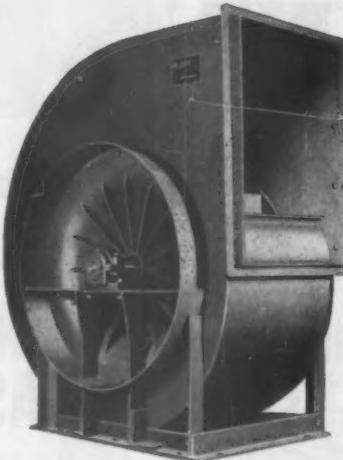


Reduced machining operations and improved performance are the benefits Power Brake Equipment Co. reports from switching to type HH shell-molded butterfly valves. The flappers had been produced from a three-piece assembly involving several machining operations, plus welding and stress relieving. With the shell-molded valves no additional fabrication is required, except for turning the shafts to fit housing bearing. Heat distortion of the valves at 1350° F was also eliminated.

Write No. 263 on Inquiry Card—Page 34



MAY 23, 1960



## 'BUFFALO' MAKES IT EASY TO SELECT THE RIGHT FAN!

... or the right air conditioning unit.

In the first place, you're safe in selecting 'Buffalo', choice of industry for the past 83 years. 'Buffalo' design and construction permit no compromise with performance qualities.

Choose from a complete line. From the little "E" Blower (for gas line boosting and blowing small furnaces) to the giant "BL" shown above (for large air handling systems), there's a "best" fan for every job. The same is true of 'Buffalo' Air Handling Units, which offer everything from heating and ventilating to full air conditioning.

The Zone Control Cabinet shown provides a number of zones with selective air conditions.



'Buffalo' Engineering Representatives in principle cities are ready to work with your engineers at any time. These are factory-trained engineers with extensive application experience. Call in the one near you—get his recommendations on the fan or unit for your job—see how easy it is to select the one that will make everyone happy for years to come!



### BUFFALO FORCE COMPANY

Buffalo, New York



Buffalo air handling equipment to move, heat, cool, dehumidify and clean air and other gases.



Buffalo Machine Tools to drill, punch, shear, bond, still, notch and tape for production or plant maintenance.



Buffalo Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.



Sugar machinery to process sugar cane, coffee and rice.  
Special processing machinery for chemicals.

For More Information Write No. 76 on Inquiry Card—Page 34

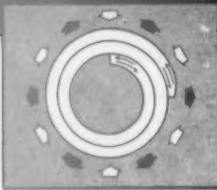
# \*SPIROL the true spring PIN

You pay no more for  
this better engineered pin  
with real spring coils

DIAMETERS:  $\frac{1}{32}$ " to  $\frac{1}{2}$ "

LENGTHS:  $\frac{1}{8}$ " to 4"

ONLY SPIROL GIVES YOU **ALL** THESE  
COST-SAVING, PRODUCT-IMPROVING FEATURES



#### 360° RADIAL SPRING TENSION

Absorbs shock loads  
from any direction—no  
weak points.



#### REPLACES OTHER PINS

Replaces grooved, slot-  
ted tubular, tapered, and  
solid pins.

**MINIATURE PIN SIZES** Spirol pins available in  
 $1/32$ " — .039" —  $3/64$ " — .052" diameters.

**NON-HEAT-TREATED ALLOYS** Spirol's resilience  
permits use of low-cost nickel stainless steel (alloy  
302). Also available in chrome steel, carbon steel,  
hardened and tempered.

#### PLUS AND MINUS HOLE TOLERANCES

Doubles allowable tolerances — reduces drilling costs  
and rejects.

... and greater shock, shear, and vibration  
resistance — perfect lead-in chamfer —  
easy insertion and removal — reusable  
— meets MIL specs.

**FREE!** Write for new illustrated  
data handbook with detailed  
specifications and prices.



C. E. M. COMPANY, INC. • 43 SCHOOL STREET • DANIELSON, CONN.  
For More Information Write No. 77 on Inquiry Card—Page 34



for stainless steel

## STAMPINGS SPUN SHAPES CASTINGS

AND FOR PORCELAIN ENAMELING

Consult  
**VOLLRATH**



#### DEEP DRAWN stainless steel BLENDER JAR

seamless  
contour-shaped

Do your operations call for  
deep drawn or spun stainless  
steel shapes? ... for stainless steel  
castings? ... for vitreous  
enameled products? Consult Vollrath,  
a reliable centralized source of  
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products—to your specifications.

Complete volume production facilities  
are at your service in our  
progressive plant: tool and die shop,  
heavy presses, flow-form spinning  
machines, efficient polishing  
equipment, conveyorized enameling  
shop, and a modern foundry with  
machining and x-ray inspection  
for sand and centrifugal castings.

For forming and finishing metal—  
any size, any shape—consult  
Vollrath, specialists in quality  
manufacture since 1874.

Write today to CONTRACT SALES DIVISION

### THE VOLLRATH CO.

Box 611, Sheboygan, Wisconsin

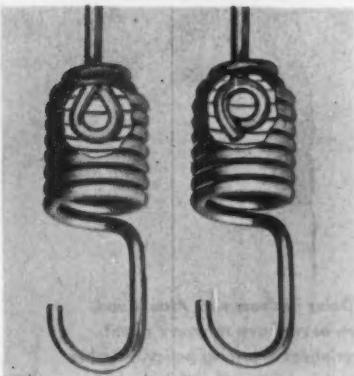
Phone: GLencourt 7-4851

Sales offices: New York, Chicago, Los Angeles



For More Information Write No. 78 on Inquiry Card—Page 34

**Spring Redesign Ends  
Breakage, Saves \$1000**



The spring shown above uses motive power of off-the-road equipment to return brake pedal after foot pressure. Connecting link inserted within old spring (left) has sharp end that rubbed on the tapered coils, causing wear and breakage. Associated Spring Corp. suggested redesigning the linkage with an additional one half turn (right). Breakage was eliminated. Need for spring replacements was reduced, so spare parts inventory requirements were lower. Total savings in less than 18 months: \$18,000.

Write No. 264 on Inquiry Card—Page 34

**New Material Eliminates  
Two Finishing Operations**

A major manufacturer of brass buttons has reduced production costs by switching to a special material developed by the Metals Division of Olin Mathieson Chemical Corp. Formerly the manufacturer used quarter hard, rolled temper brass but he had to add finishing operations. The problem was partially solved by acid cleaning and brite dipping at additional cost. Use of the special Western Brass resulted in buttons requiring no finishing steps to improve the surface appearance.

Write No. 265 on Inquiry Card—Page 34

**For a Complete Report  
On the 45th Annual  
N.A.P.A. Convention  
Don't Miss the June 20th  
Issue of  
PURCHASING Magazine**

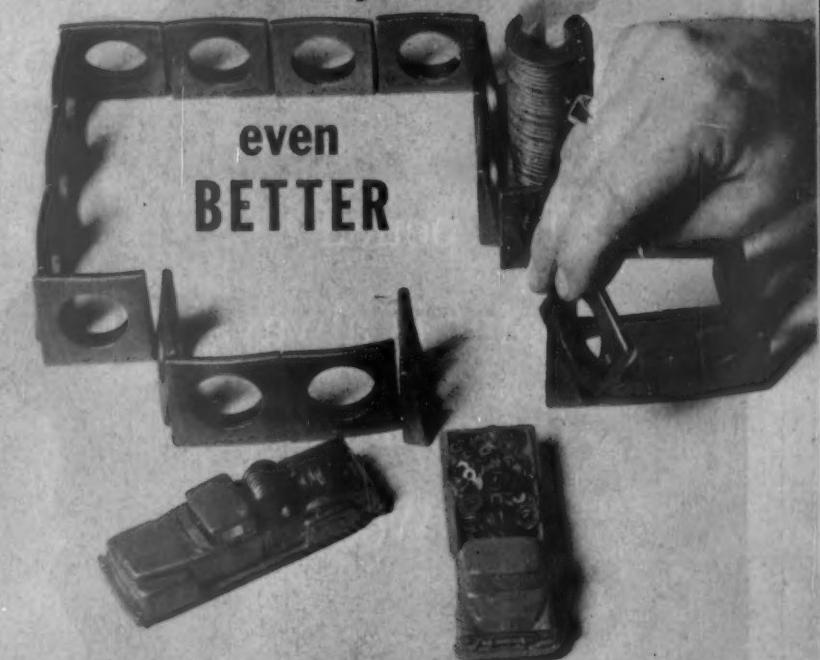
For More Information Write No. 79  
on Inquiry Card—Page 34→

MAY 23, 1960

# JOLIET

**has EXPANDED AGAIN  
to serve you**

**even  
BETTER**



Less than four years ago, JOLIET completed an expansion program increasing its production potential by 40%. Now, additional production space has just been built. And new high speed production equipment is being added now to provide ample capacity to match industry's growing demand for JOLIET washers of all types — standards and specials, any size, any metal, any quantity. Be assured: JOLIET will continue to be your No. 1 Source for top quality washers — promptly delivered — now and tomorrow.

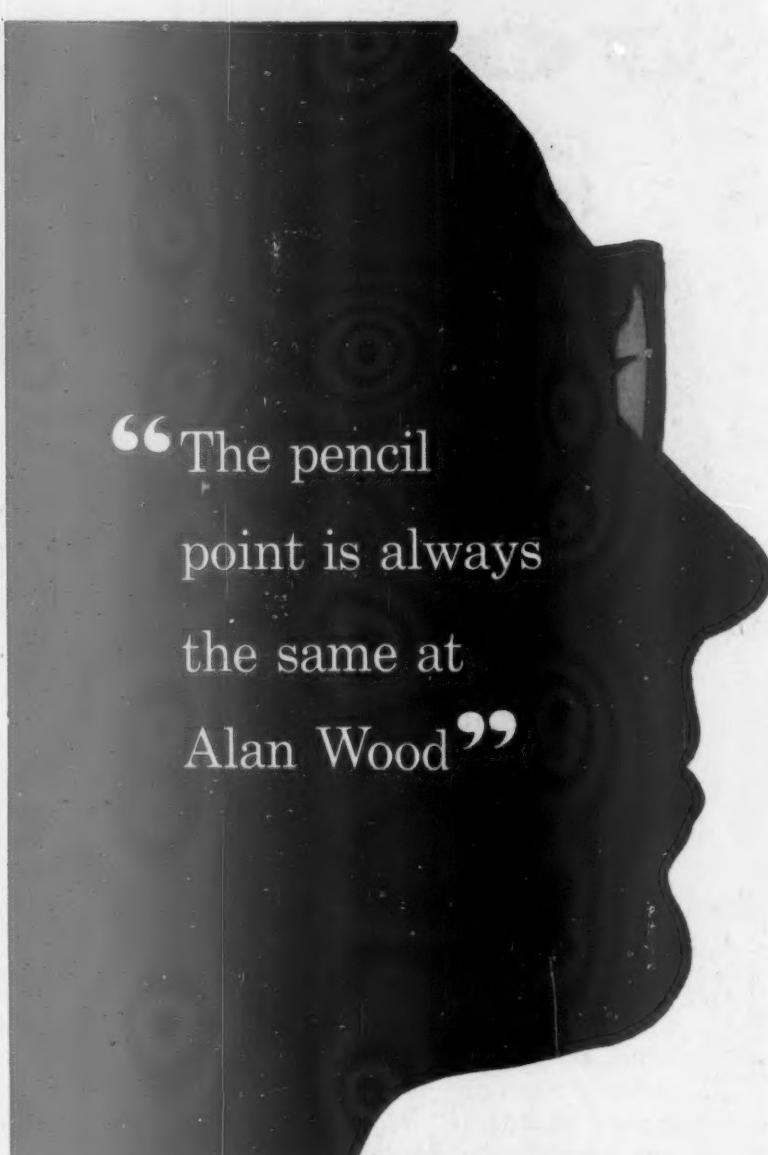


## **JOLIET WROUGHT WASHER CO.**

**210 Connell Avenue  
Joliet, Illinois**



Write for new 16-page catalog  
covering our extensive line of  
standard and special washers.



“The pencil  
point is always  
the same at  
Alan Wood”

*"Doing business with Alan Wood,  
we never have to worry about  
variations in pricing policy. Whether  
steel is short or plentiful, the  
pencil point is always the same."*

That's the way one Alan Wood customer said it, and we appreciate the acknowledgement. We do believe in consistent pricing policy. Moreover, Alan Wood is geared to give your order prompt attention without red tape delays. Your quality goes up, your costs and rejects go down, when you use dependable Alan Wood plate, sheet and strip.

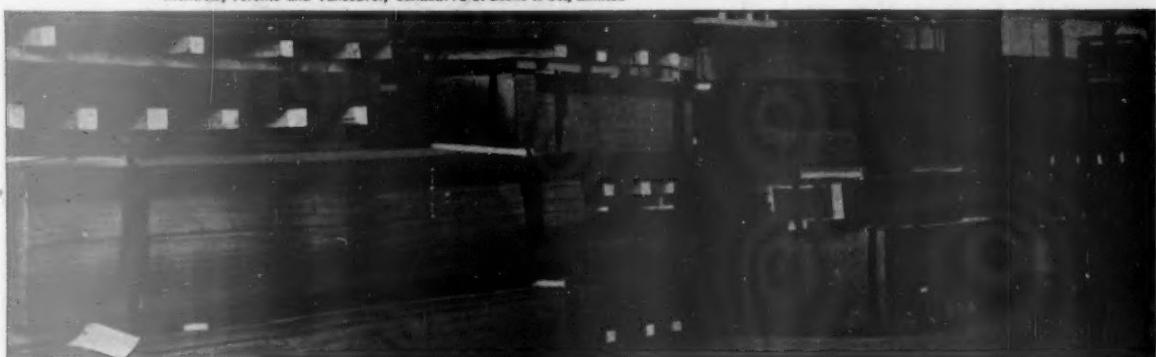
When your metallurgical requirements need speedy, reliable analysis, ask for an Alan Wood study. Your Alan Wood representative is always available, ready to help.

## ALAN WOOD STEEL COMPANY



Clyde, Pa. • STEEL PRODUCERS WITH THE CUSTOMER IN MIND

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Los Angeles • Boston • Atlanta  
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Montreal, Toronto and Vancouver, Canada: A. C. Leslie & Co., Limited



For More Information Write No. 80 on Inquiry Card—Page 34



# V

## Materials

# A

**V**  
VALUE ANALYSIS  
**A**

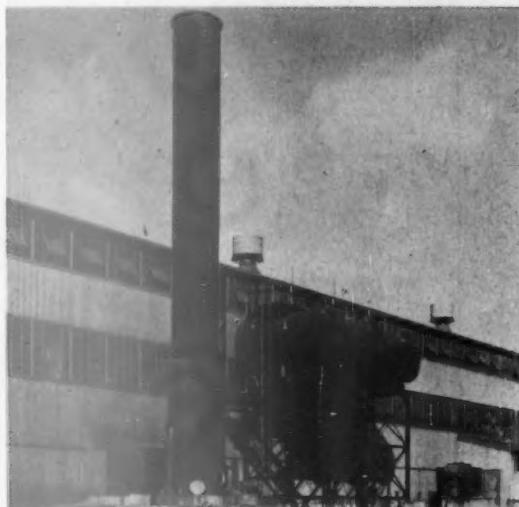
## Materials



### Polyester Switch Housing Cuts Development Cost and Time

Housings made of polyester molding compound aided the development of a new line of speed-responsive switches which are compact, versatile, and maintenance-free. Use of reinforced polyester saved the Euclid Electric and Manufacturing Co. four months development time and \$15,000 in model and die costs. Molding compound is made by Atlas Powder Co.

WRITE NO. 81 ON INQUIRY CARD—PAGE 34



### Low-Cost Epoxy Coating Protects Stack from Corrosion

Acme-Newport Steel Co. spent about \$1800 to protect a pickling line exhaust stack against corrosion. Two years ago an epoxy resin coating supplied by Fibre Glass-Evercoat Co. was troweled to the interior of the stack during a weekend shutdown. The coating formulation was FE-103 chemically resistant epoxy, based on Shell Chemical Company's Epon resin 820. The coating is still intact and is expected to serve for at least five years. A rubber lining for the stack would have cost close to \$4000 and would have required shutdown of the pickling line for 4 to 6 weeks.

WRITE NO. 82 ON INQUIRY CARD—PAGE 34



### Protective Paper Eliminates Costly Re-Polishing

Girton Mfg. Co. formerly had to re-polish stainless steel dairy equipment that had been scratched during manufacture. Now the company applies Protecto-Mask, made by Mystik Adhesive Products, to the steel sheets before they are fabricated. The protective paper, coated with a pressure-sensitive adhesive is applied directly from a roll and peels off quickly and cleanly. Steel remains unscratched and re-polishing is unnecessary.

WRITE NO. 83 ON INQUIRY CARD—PAGE 34

# Value analysis-

(nothing new to Armour Ammonia specialists)



For a great many years Ammonia specialists from Armour have been joining manufacturers at the conference table. The primary concern of these Armour men is to use their knowledge and experience with ammonia to help in the analyzation of metal products and heat-treating production methods.

Cost reductions, product improvements, labor-saving and safety procedures are a few of the many areas where the men from Armour may aid you. In addition, they can supply equipment lists, blueprints, and on-the-job supervision of ammonia storage equipment installations. Armour also offers informative technical bulletins and reports on the use and control of ammonia atmospheres.

Take advantage of this experience and service from

Armour . . . the leader in the development of ammonia-derived atmospheres for heat treating. Buy Armour Anhydrous Ammonia—at least 99.98% pure when delivered . . . backed by technical service, whenever you need it, at no extra cost.

**Ammonia Sales**



**Armour Industrial Chemical Company**

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110 North Wacker Drive • Chicago 6, Illinois

For More Information Write No. 84 on Inquiry Card—Page 34

MAY 23, 1960

165

VALUE ANALYSIS

V  
A

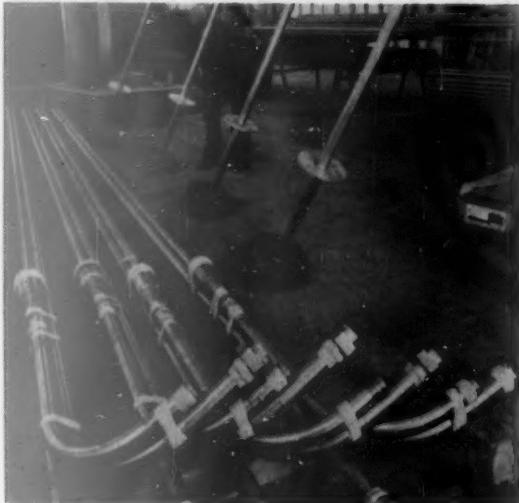
## Materials



### Alloy Molds Pass 70 Cycles; Others Fail to Complete One

Where all other high-temperature materials failed to complete even one successful firing cycle, press molds made of Hastelloy alloy X have just passed the 70-cycle mark. The molds operate at 2200F while under nine tons of pressure in the firing of a 36 sq. in. mass of ceramic material at Gulton Industries. Molds are made from the alloy produced by Haynes Stellite Company, division of Union Carbide.

WRITE NO. 85 ON INQUIRY CARD—PAGE 34



### Corrosion Proof Titanium Makes Nickel Extraction Process Feasible

Over 28,000 pounds of titanium are used at the Freeport Nickel Co.'s nickel extraction plant at Moa Bay. Supplied by the Republic Steel Corp., the titanium is used as pipe, fittings, and liners in the acid leaching reactors where the nickel is extracted from ores. Titanium proved the most practical material to resist high corrosion of slurries of cobalt, nickel, and acid at high temperatures and pressures.

WRITE NO. 86 ON INQUIRY CARD—PAGE 34



### Switch From Metal Covers to Nylon Curtains Cuts Costs

Sheet metal covers used in steam-curing precast concrete drainage products developed leaks, had to be patched regularly, and lasted less than a year. Standard Precast Products Co. switched to neoprene-coated nylon curing curtains and saved \$75 per casting station on initial cost alone. The curtains also cut labor cost, storage space, upkeep and replacement cost. Steamtight, they conserve steam and save curing time. The covers are made by Reeves Brothers, Inc.

WRITE NO. 87 ON INQUIRY CARD—PAGE 34

For More Information about ad on facing page Write No. 88 on Inquiry Card—pg. 34→ PURCHASING

YOUR GUIDE TO



# THERMOPLASTICS

STYRON®  
POLYETHYLENE  
TYRIL®  
PELASPAN®  
PVC RESINS  
SARAN  
ZERLON®  
ETHOCEL®

AMERICA'S FIRST FAMILY  
OF THERMOPLASTICS

Dow

PROVED IN USE FOR:

REFRIGERATOR PARTS  
AUTOMOBILE PARTS  
WALL TILE  
HOUSEWARES  
CAMERA COMPONENTS  
LIGHTING LOUVERS  
RADIO CABINETS  
VIALS AND CONTAINERS  
PHOTO DEVELOPING TANKS  
SCALE MODELS  
APPLIANCE HOUSINGS  
PACKAGING (RIGID)  
CLOSURES  
TABLE LEGS

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

# STYRON®

**POLYSTYRENE.** Styron is Dow's trademark for its huge family of polystyrene molding formulations. There's almost no limit to the uses of these versatile materials, covering the full range of products for daily living. General purpose Styron materials combine economy with improved molding and extrusion properties. Special high impact formulations provide great strength and increased heat resistance. Styron also offers low moisture absorption, high dimensional stability, wide range of colors. Styron Verelite is light stabilized. Styron can be extruded, vacuum formed, calendered, and injection molded.

#### GENERAL PURPOSE:

**STYRON 666**—Widely used for molding and extrusion. Excellent balance of physical properties.

**STYRON 666M**—Similar to 666, with improved flow characteristics.

**STYRON 689**—Highest flow characteristics, for general purpose molding.

#### HEAT RESISTANT:

**STYRON 683**—General purpose type, good heat resistance.

**STYRON 700**—Highest heat resistant polystyrene.

**STYRON 690**—Improved toughness, good heat resistance.

#### IMPACT GRADES:

**STYRON 330**—Medium impact, improved flow and translucency.

**STYRON 777**—Medium impact, improved physical properties for fabricating, molding and extruding.

**STYRON 475**—High impact, with 3 to 5 times greater impact strength and 9 times greater elongation than general purpose formulations.

**STYRON 475M**—Easy flow, high impact.

**STYRON 475B**—Extra high impact.

**STYRON 475C**—Extra high impact, easy flow.

**STYRON 480**—Extreme impact strength, good heat resistance.

#### HIGH IMPACT, HEAT RESISTANT:

**STYRON 369**—Medium impact, high heat resistance.

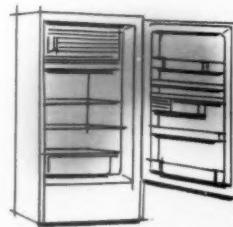
**STYRON 440**—High impact, high heat resistance.

**STYRON 440M**—Styron 440 type with improved flow.

#### LIGHT STABILIZED:

**STYRON 672 VERELITE**—General purpose, light stabilized for molding.

**STYRON 673 VERELITE**—General purpose, light stabilized for extrusion.



Dow

PROVED IN USE FOR:

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

BOTTLES

WIRE COVERING

CABLE COVERING

PACKAGING FILM

CLOSURES

HOUSEWARES

TOYS

PIPE

INDUSTRIAL PARTS  
AND COMPONENTS

FOOD PACKAGING MATERIALS

FITMENTS AND LIDS

CONSTRUCTION-AG FILM

INDUSTRIAL PACKAGING

TABLE CLOTHS AND DRAPERIES

FILMS

# POLYETHYLENE

Almost unlimited property combinations are possible with Dow's complete line of polyethylene—in low, medium, and high densities. Dow provides the industry's most complete line of molding and extrusion formulations. Dow polyethylene is tough and flexible over a range of temperatures from below -25° to above 210° F. Toughness, clarity and moisture barrier characteristics make it ideal for film applications. Other outstanding properties are: high finish, crack resistance, and superior impact resistance.

## GENERAL PURPOSE:

**610M, 550E, 610M**—Housewares, containers, closures, toys, shoe parts, industrial parts, etc. For both injection molding and extrusion.

**700M, 900M, 901M, 910M, 770M, 771M, 990M, 991M, 1000M, 1001M**—Recommended for injection molding of above product types.

**510E, 515E**—Low density—impact film resin, agriculture and construction and heavy duty bags.

**644, 645, 646, 641, 642, 643, 644**—Low density—high-gloss, high-clarity packaging resin.

**562, 563, 564, 565E**—Low density—gloss, clarity, impact, lack of haze, general purpose resin from produce through textile packaging.

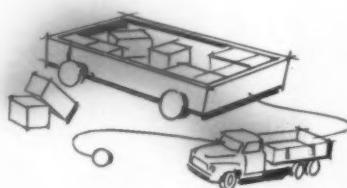
**662, 663E**—Medium density (.930) overwrap type film resin. .935 density also available for breadwrap.

**775E**—Garment bag film.

**PC52, PC55**—For extrusion of pipe.

**103A1, 107A3, 303A1, 305A3, 305A4**—Electrical grades for wire and cable covering, extrusion.

For extruded bottles, sheet tubing, shapes, and filaments, certain of the above formulations are ideal.



PROVED IN USE FOR:

AUTOMOBILE PARTS  
 APPLIANCE COMPONENTS  
 NOZZLES  
 TUMBLERS  
 CLOSURES  
 MEDICAL EQUIPMENT  
 COMPONENTS  
 BRUSH BLOCKS  
 BATTERIES  
 TELEPHONE COMPONENTS  
 FILM  
 FOOD CONTAINERS  
 BRISTLES AND FILTERS  
 MONOFILAMENTS

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

# TYRIL®

**A COPOLYMER OF STYRENE ACRYLONITRILE.** Tyril is a rigid thermoplastic material with exceptionally high strength and toughness. High critical elongation means high resistance to crazing, and long service life for molded parts. Close fitting working parts benefit from high dimensional stability, too. Where resistance to acids, bases, salts, oils, waxes, soaps, food stains and solvents is important, Tyril serves well. And Tyril is easily molded or extruded.

**STRENGTH**—Tyril has a tensile strength ( $\frac{1}{4}$ " test bar) of 10,000 psi. Elongation is 3.5%, average value. The stress required to crack or craze Tyril in air is two to three times that of general purpose polystyrene.

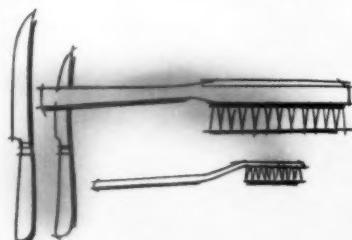
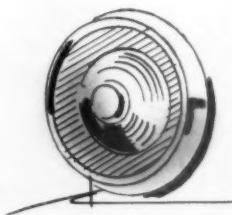
**FOOD SAFETY**—Tyril has been accepted for food contact by the Food and Drug Administration, and by the Meat Inspection Division, Agricultural Research Service, U.S.D.A.

**THERMAL STABILITY**—Stability of Tyril to fabrication tem-

peratures is good, if recommended procedures are followed.

**EXTRUSION**—Tyril can be extruded in any shape normally possible with rigid thermoplastic materials. However, its characteristics and properties adapt it especially well for bristles and other monofilament applications.

**INJECTION MOLDING**—Tyril can be molded at cylinder temperatures of 400°F. to 550°F. with conventional machines and molds.



Dow

PROVED IN USE FOR:

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

THERMAL INSULATION

BUOYANCY

SANDWICH PANEL CORES

PACKAGING

SHOCK ABSORPTION

TOYS

NOVELTIES

DISPLAYS

LOW DENSITY FILLER

REFRIGERATOR COMPONENTS

# PELASPAN®

**EXPANDABLE POLYSTYRENE BEADS.** Developed by Dow,

Pelaspan is expandable polystyrene in bead form. Pelaspan is processed by prefoaming and subsequent heating in a retaining mold. This results in a smooth surfaced foam that takes the exact shape of the mold, even to intricate contours and convolutions.

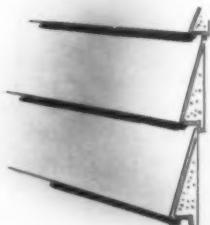
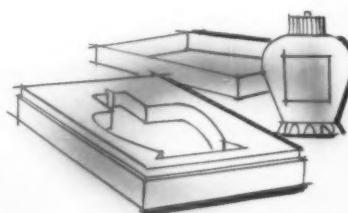
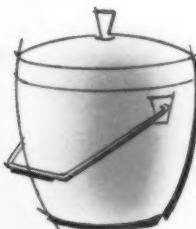
Almost unlimited shapes and sizes are obtainable. The density of Pelaspan can be varied from 1 to 15 pounds/cu. ft. to provide the precise properties required for insulation, packaging, and other applications.

**FORMULATIONS**—Pelaspan 8 for regular molding. Pelaspan 18 for molding applications requiring self-extinguishing material. Both formulations may be colored, using dry blend or dye coloring.

**PHYSICAL PROPERTIES**—Both Pelaspan 8 and 18 have:  
Low thermal conductivity • Low water absorption • Low vapor transmission • High strength-to-weight ratio • Smooth surface • Attractive appearance.

**CUSHIONING EFFECT**—One of the most useful physical properties of Pelaspan is its ability to cushion without rebound where impact occurs. This makes it uniquely valuable for the packaging, packing and shipping of fragile articles, precision instruments and equipment.

**BONDING**—Pelaspan can be foamed and bonded simultaneously to metals, other nonporous materials and porous materials using thermally sensitive type adhesives.





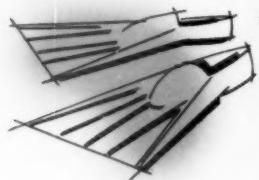
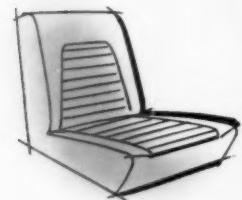
PROVED IN USE FOR:

WIRE COVERING  
FILM AND SHEETING  
DRAPERIES  
SHOWER CURTAINS  
GARDEN HOSE  
SHOE WELTING  
TUBING  
GASKETS  
CLOSURES  
INFLATABLE GOODS

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

# PVC RESINS

Available in a complete range of high, medium and low molecular weights, Dow PVC resins have controlled particle size, excellent color and clarity, and remarkable resistance to heat and light. They are furnished as free flowing, unformulated white powders suitable for dry blend processing. Dow PVC resins are suitable for calendering, extruding, and molding.



**PVC-100-4**, moderately high molecular weight. Has good dry blendability, and excellent physical, aging and electrical properties. UL approved as interchangeable electrical resin.

**PVC-144**, intermediate molecular weight. Possesses optimum combination of dry blendability, processability, and physical and

electrical properties. UL approved as interchangeable electrical resin.

**PVC-168**, an extra low molecular weight PVC homopolymer resin which retains the physical and heat stability characteristics of homopolymer resins, while approaching the processing characteristics of copolymers. Excellent for rigids.

**PVC-111-4**, medium molecular weight. For rigid applications, and general purpose use. Wide acceptance in shape and film extrusions, and high speed calendering.

**PVC-133-4**, medium molecular weight. Easy processing, high plasticizer absorption resin for dry premixes at room temperature, and dry blend extrusions with high plasticizer content.



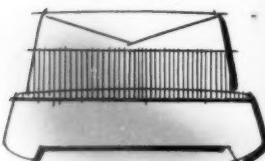
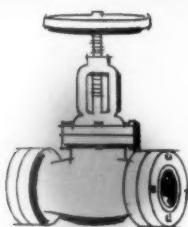
PROVED FOR USE IN:

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

# SARAN

AUTO SEAT COVERS  
UPHOLSTERY  
DRAPERIES  
CARPETING  
BRISTLES  
PACKAGING FILM  
FITTINGS AND COUPLINGS  
PIPE AND PIPE LINING  
ACID RESISTANT FILTER CLOTHS  
AWNINGS  
DOLL HAIR

**POLYVINYLDENE CHLORIDE RESINS.** Saran resins are among the most inert of all thermoplastics. They offer outstanding combinations of properties: toughness, flexibility, durability, abrasion resistance, extreme chemical resistance. They are colorless, odorless, self-extinguishing and have extremely low water absorption and vapor transmission rates. Primary processing methods are molding and extrusion.



**SARAN 115E, 820, 843, 732**—For extruding as monofilaments, for woven products.

**SARAN 862, 909, 723, 422, 746**—For extrusion as multifilaments and fine fibers.

**SARAN 864**—For extruded tubing and sheeting.

**SARAN 281**—Molding, for pipe fittings, other industrial products.



DOW

PROVED FOR USE IN:

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

AUTOMOBILE COMPONENTS

APPLIANCE PARTS

DISPLAYS

OUTDOOR SIGNS

SPECIALTY ITEMS

NOVELTIES

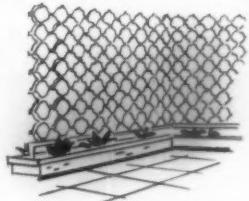
DECORATIVE PRODUCTS

BOAT WINDSHIELDS

# ZERLON®

#### COPOLYMER OF METHYL METHACRYLATE

**STYRENE** Zerlon is the newest of Dow's thermoplastics. This unique methyl methacrylate styrene copolymer offers an outstanding combination of properties: optical clarity, resistance to weathering, high tensile strength, high elongation, toughness, and resistance to heat. Zerlon is economical because of low material cost, and ease of fabrication. A single formulation, Zerlon 150, is suitable for both injection molding and extrusion.



**MOLDING**—Zerlon 150 can be molded with conventional equipment. Because it is not compatible with other thermoplastic materials, cylinders should be purged before molding.

**EXTRUSION**—Zerlon 150 can readily be extruded into many shapes, and sheeting. Conventional extruders with length-to-diameter ratios of 18:1 or greater are preferred.

Dow

PROVED IN USE FOR:

AMERICA'S FIRST FAMILY OF THERMOPLASTICS

FOOTBALL HELMETS

SAFETY HEADGEAR

TOOTHBRUSH HANDLES

LUGGAGE

APPLIANCE PARTS

TABLE EDGINGS

VACUUM FORMING

CIGAR HOLDERS

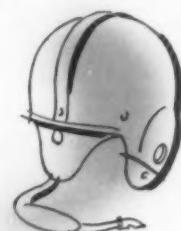
CHAIR ARM RESTS

MILITARY USES

# ETHOCEL®

**DOW ETHYLCELLULOSE.** Ethocel molding compounds provide a maximum of toughness, dimensional stability, chemical resistance and high impact strength. Its excellent moldability makes large, single-unit moldings practical. Ethocel is available in a full range of transparent, translucent and opaque colors, with a high lustre.

For coatings applications, Ethocel offers an unusual combination of properties—heat stability, low temperature flexibility, compatibility with waxes and low cost plasticizers.



**ETHOCEL 860**—General purpose for molding and extrusion.

**ETHOCEL 865**—Extremely rigid, good low-temperature impact resistance, high gloss.

**ETHOCEL 856**—Less rigid than 855. Excellent dimensional stability.

**ETHOCEL 870**—Good impact resistance, high heat resistance.

**ETHOCEL 880**—Extreme impact resistance at low temperatures.

**ETHOCEL 890**—Extreme heat resistance, high impact resistance.



## THE MOST COMPLETE LINE OF THERMOPLASTICS

Dow offers the most complete line of thermoplastic materials in the industry, including eight basic materials and scores of special formulations from which to choose. The continual program of research and development provides Dow customers with the most modern of materials . . . backed up by fast delivery, convenient warehousing and prompt technical assistance in their use.

### SALES OFFICES

ATLANTA 3, Georgia.....	1714 Fulton National Bank Building
BOSTON 16, Massachusetts.....	520 Boylston Street
BUFFALO 2, New York.....	70 Niagara Street
CAMDEN 2, New Jersey.....	400 Market Street
CHARLOTTE 2, North Carolina.....	504 Wachovia Bank Building
CHICAGO 48, Illinois.....	6000 W. Touhy Avenue
CINCINNATI 6, Ohio.....	2330 Victory Parkway
CLEVELAND 13, Ohio.....	55 Public Square
DALLAS 1, Texas.....	1505 Elm Street
DETROIT 2, Michigan.....	450 Fisher Building
HOUSTON 25, Texas.....	6910 Fannin Street
LOS ANGELES 17, California.....	900 Wilshire Boulevard
MINNEAPOLIS 3, Minnesota.....	1750 Hennepin Avenue
NEW ORLEANS 12, Louisiana.....	1100 Commerce Building
NEW YORK 20, New York.....	45 Rockefeller Plaza
PITTSBURGH 22, Pennsylvania.....	One Gateway Center
ST. LOUIS 5, Missouri.....	10 South Brentwood Blvd.
SAN FRANCISCO 4, California.....	350 Sansome Street
SEATTLE 1, Washington.....	307 Broad Street
Dow Chemical of Canada, Limited General Offices and Plant.....	Sarnia, Ontario

Plastics Sales Department 1808  
**THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN**

# Materials

VALUE ANALYSIS

A

## Mile-Long Thinwall Aluminum Pipe Cuts Material Cost by 20%

Use of Alcoa's Unistrength aluminum pipe has cut pipe cost by 20% in a new mile-long gas pipe line installed by the Columbia Gulf Transmission Co. The seamless pipe provides thicker walls at the ends to compensate for loss of strength caused by welding, while thinner walls throughout the rest of the section mean less weight and lower cost. Further savings are realized as pipe does not need to be wrapped or coated.

WRITE NO. 89 ON INQUIRY CARD—PAGE 34



## Clutch Facing Rejects Cut 80% With Friction Component

Processing reject rate in the production of clutch facings made by Standco Brake Lining Co. were running at the rate of 20%. Chief reason was "blistering" or internal voids caused by powdered-resin, heat-setting binder used. By switching to Cardolite CNS1 friction component NC-121, made by Minnesota Mining, Standco cut the reject to 4%, reduced curing time by nearly a half, and increased production considerably.

WRITE NO. 90 ON INQUIRY CARD—PAGE 34

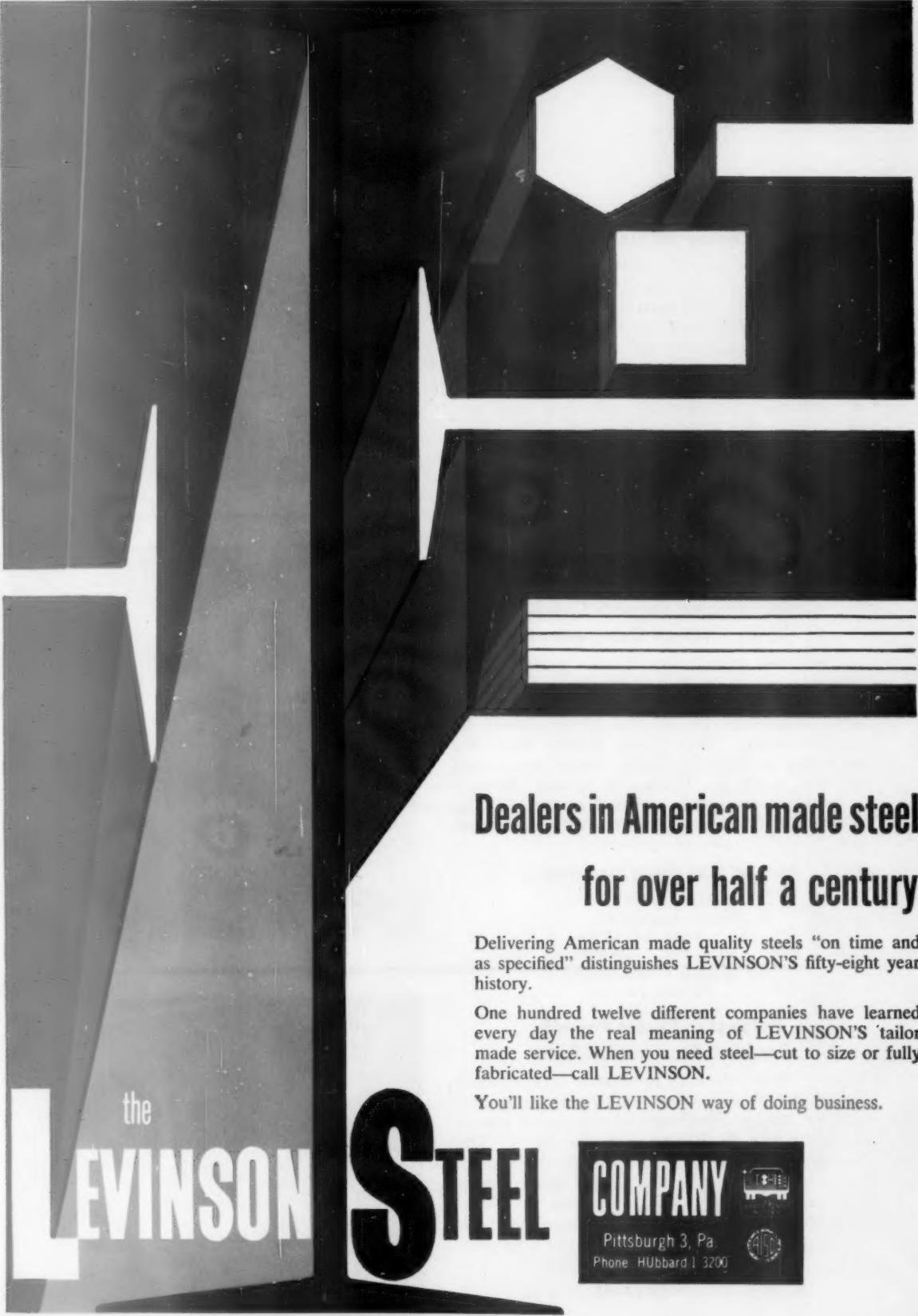


## Polyester Resins Permit Doubled Production Rate

H. D. Willcutts Co., producers of reinforced plastic trailers was able to double its production rate by taking advantage of the rapid curing characteristics of Polylite polyester resins. The company now trims panels used for the trailers during cure. The only tool needed is a common linoleum knife. Previously, trimming had to be done after cure—with rotary saws equipped with costly carbide tips. Polylite resins are a product of Reichhold Chemicals, Inc.

WRITE NO. 91 ON INQUIRY CARD—PAGE 34





**Dealers in American made steel  
for over half a century**

Delivering American made quality steels "on time and as specified" distinguishes LEVINSON'S fifty-eight year history.

One hundred twelve different companies have learned every day the real meaning of LEVINSON'S tailor made service. When you need steel—cut to size or fully fabricated—call LEVINSON.

You'll like the LEVINSON way of doing business.

the  
**LEVINSON STEEL**

**COMPANY**   
Pittsburgh 3, Pa.  
Phone HUbbard 1 3200

For More Information Write No. 428 on Inquiry Card—Page 34

# Materials

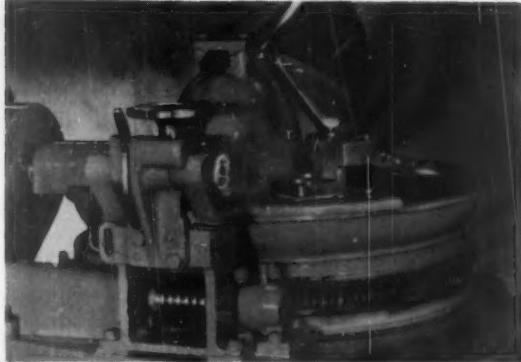
VALUE ANALYSIS

A

## Aluminum Bronze Worm Gears Handle Sand Without Lubrication

A maker of restaurant kitchen equipment turned to Ampco Metal Grade 18 for extruded rods used for worms in food cutters. To test the material's ability to stand up under severe conditions, sand and cast-iron grindings were thrown into the worm gear without lubrication. Operating efficiency was not impaired.

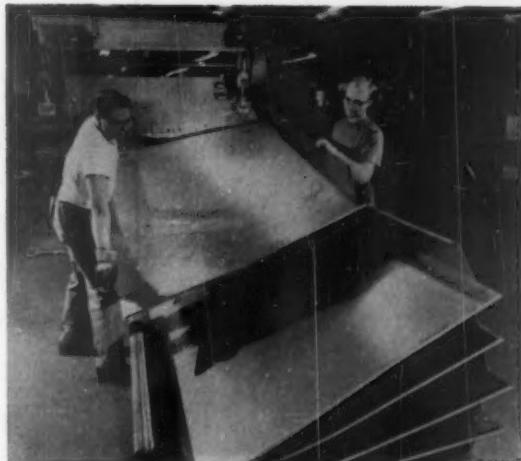
WRITE NO. 92 ON INQUIRY CARD—PAGE 34



## Use of Wide Steel Sheets Cuts Cost, Simplifies Fabrication

By using 72-inch instead of 48-inch wide cold-rolled sheet steel for housings of cooling towers, condensers and evaporators, Halsted & Mitchell has cut costs, simplified design and fabrication, and improved product appearance. Eighty percent less welding is required on the wider sheet. In addition, it was possible to redesign the housings so that full width of the sheet could be used, thereby reducing scrap loss. Excellent surfaces of the Jones & Laughlin steel also enhances the appearance of the units.

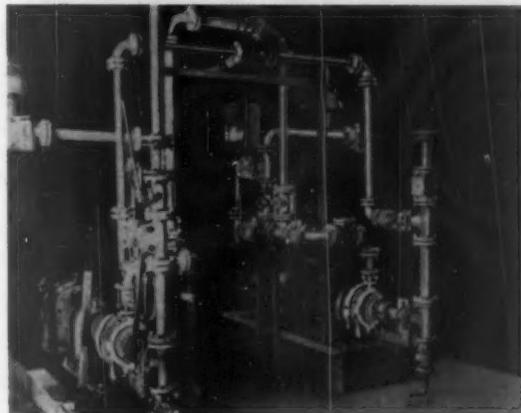
WRITE NO. 93 ON INQUIRY CARD—PAGE 34



## Teflon-Lined Pipe Saves Chemical Plant Thousands Monthly

A chemical plant tried a number of alloys, plastics and other materials for piping used in processing a chemical intermediate involving hydrochloric acid and organic liquids at temperatures exceeding 275°F. Maintenance costs were high because of the corrosive action of the fluids and product losses were high. A switch to Fluoroflex-T (Teflon-line) Resistoflex pipe eliminated those losses and enabled the company to save as much as \$60,000 a month.

WRITE NO. 94 ON INQUIRY CARD—PAGE 34



## Materials



### **Wear-Resisting Steel Boosts Complex Die's Output 400%**

Domar Buckle Mfg. Co. was getting an average of 800,000 pieces between regrindings of a progressive die producing belt buckles from half-hard brass trip. The dies were made from various high carbon, high chromium steels. It replaced the worn dies with new ones made from Carpenter Hampden die steel made by the Mel-Trol process. The new die produced 4,000,000 pieces without regrinding.

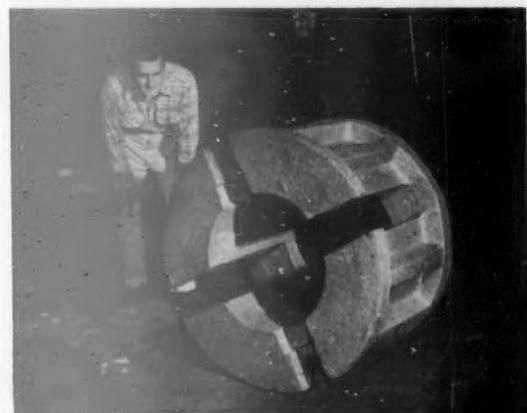
Write No. 95 on Inquiry Card—Page 34



### **Fasteners Treated With Sealant Increase Production 23%**

John W. Hobbs, Div., Stewart-Warner Corp., has increased the production of hour meters 23% by using Loctite thread locking sealant to hold screws. Formerly a resin type product had to be placed in each of 18 holes before assembling screws. Loctite sealant is tumbled with screws in plastic bag. Treated screws do not harden in air but set firmly when screws are assembled.

Write No. 96 on Inquiry Card—Page 34



### **Steel Shot Cuts Blast Cleaning Costs in Half, Improves Quality**

Atlantic Steel Castings Co. cut blast cleaning shot consumption per wheel hour to less than half by switching to Rotoblast steel shot. Atlantic makes difficult-to-clean carbon and low alloy steel castings up to 8 tons. The tough abrasives last longer than material previously used, cut shot costs in half, and give perfect quality finish. Rotoblast shot is made by Pangborn Corp.

Write No. 97 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 98 on Inquiry Card—pg. 34→

*Better products through better methods and steels*



(or how zinc-coated steel cut 5 steps from auto lamp housing fabrication). When automotive head and tail lamp housings were drawn from cold rolled sheet steel and then zinc-plated or painted, as many as five or six handling and cleaning steps were required to make them corrosion-resistant. Now, fabricated from Weirkote continuous-process zinc-coated steel, the housings go directly from the press to the assembly line. Further processing is unnecessary because Weirkote can be worked to the limits of the steel itself without chipping or flaking its corrosion-resistant zinc surface. It's this superiority that caused the automobile industry to increase its consumption of zinc-coated steel more than 700% in five years; to use it in such varied applications as mufflers, window channels and the understructures of unitized bodies; to take advantage of developments such as differentially zinc-coated steel that can be welded at top speeds. A major supplier is Weirton Steel Company—producer of Weirkote continuous-process zinc-coated steel and many other fine steels that improve products, methods and profits throughout industry.



**WEIRTON STEEL**  
Weirton, West Virginia



Weirton Steel is a division of

**NATIONAL STEEL CORPORATION**

Weirkote will also be available in 1961 from National's Midwest Steel Division, Portage, Indiana.

# Buy all these steel products



Another busy day ahead of you? Probably so, if you are responsible for purchasing the many different steel products needed by an average company. Solution: streamline your purchasing operation by making CF&I your "headquarters" for a wide range of quality steel products, including those shown on these pages.

CF&I sales offices and warehouses are

equipped for prompt delivery — which is one of the meanings behind our Corporate Image. You'll find our people more than mere "order takers". They'll take an active interest in your account to assure efficient service at all times. Call a nearby CF&I representative to learn how we can serve you with dependable steel products. He'll be glad to be of help at any time.

For complete information, write for "CF&I's Principal Products Catalog G-50."

**THE COLORADO FUEL AND IRON CORPORATION**  
DENVER • OAKLAND • NEW YORK

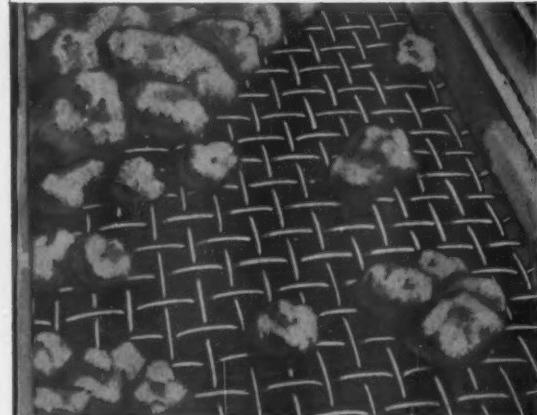


2477

**REALOCK CHAIN LINK FENCE**—This rugged fence gives permanent protection for property, buildings and outdoor storage areas. Available in galvanized steel which is highly rust resistant. Made in a variety of heights, with barbed or knuckled selvages, with or without barbed wire tops. Ask for a free estimate at no obligation.

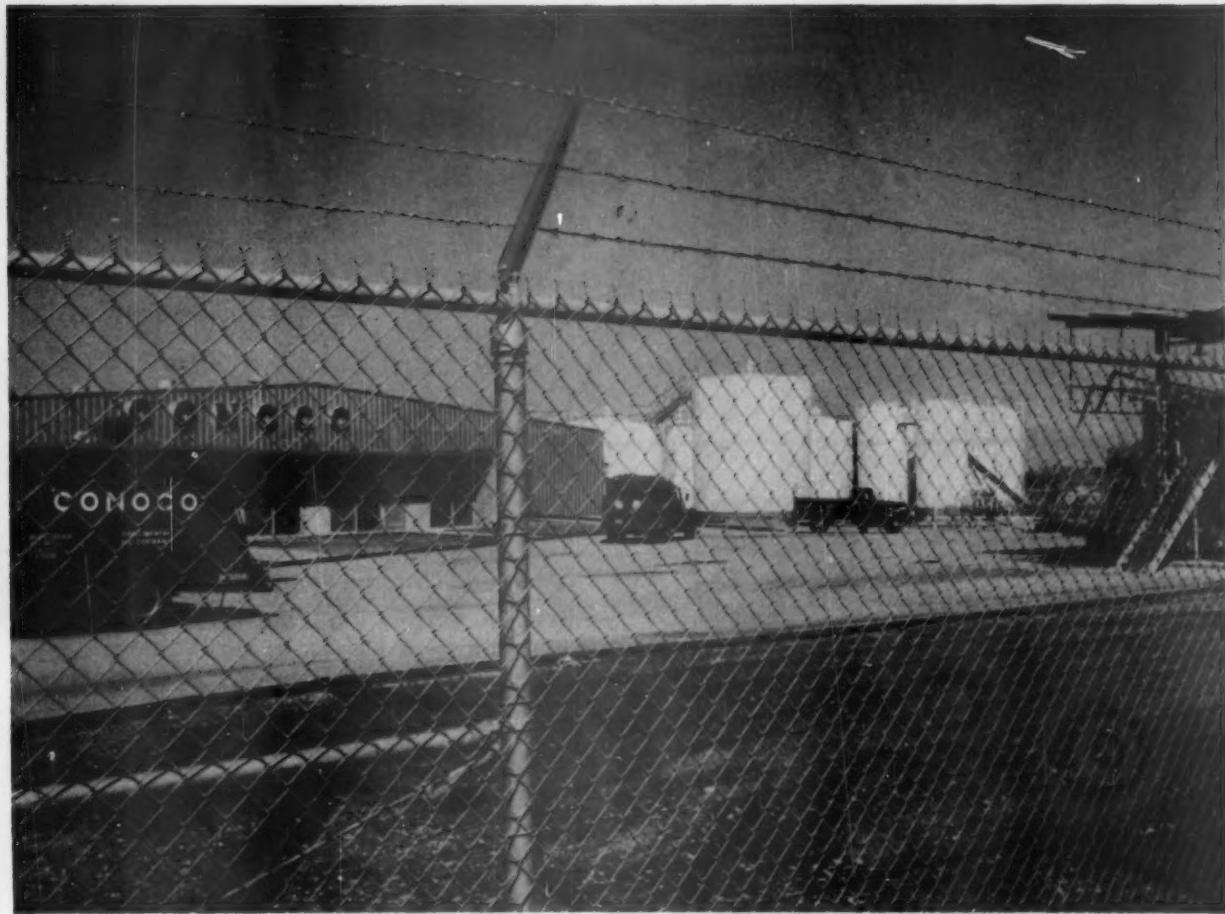


**SPRINGS AND FORMED WIRES**—CF&I-Wickwire Springs meet your industrial needs. You get quick delivery on compression, extension, torsion and flat springs in virtually any size, material or finish. CF&I engineers are always ready to help in designing special springs for specific applications.

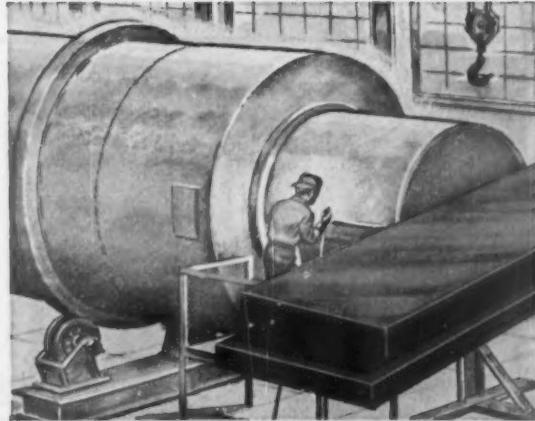


**SPACE SCREENS**—CF&I Space Screens are known for their accuracy and screening economy. Precision weaving and careful crimping assure long life. We tailor-make screens to give you average, rapid or slow screening, or maximum through capacity. Let us know your requirements.

# from one source...CF&I



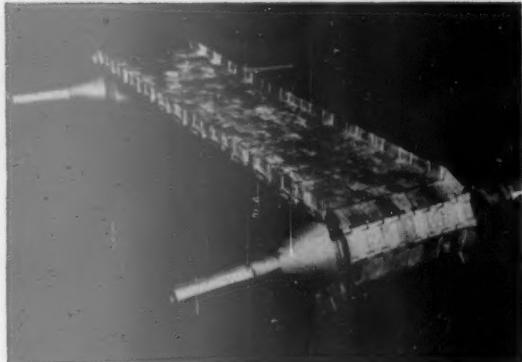
**WIRE ROPE**—CF&I's 60 years of wire rope experience pays off in a safe rope that protects against injury and damaged equipment. These wire ropes are job-designed in various constructions, sizes and grades. Our newest wire rope—Double Gray-X—gives extra-high breaking strength and longer rope life.



**STEEL PLATES**—CF&I's Claymont plant is one of the leading producers of steel plates for all industrial uses. Made to ASTM and AISI specifications, they are produced in carbon steel, alloy steel and stainless-clad steel to meet specific requirements.

For More Information Write No. 99 on Inquiry Card—Page 34

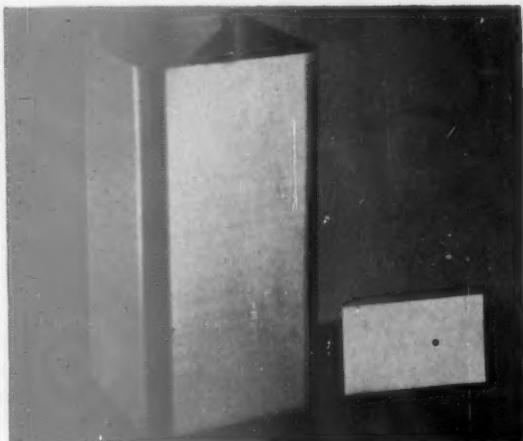
# V VALUE ANALYSIS A **Materials**



## **Cast High Alloy Belts Make Continuous Heat Treating Possible**

In a recent change from batch to continuous heat treating at the National Screw and Mfg. Co., Cleveland, high alloy castings were chosen for the continuous belts in two furnaces installed by the Surface Combustion Co. Cast alloy has double the strength of wrought material at the furnace operating temperature of 1600F. The conveyors integrate hardening, quenching and tempering, thus reducing operating and maintenance costs.

Write No. 100 on Inquiry Card—Page 34



## **Molds of Aluminized Steel Speed Casting Process**

Westinghouse Electric Corp., Blairstown, Pa., formerly used a costly high nickel alloy for investment casting mold cells. Difficulty in removing matrix from cell caused expensive reconditioning between casts. Carbon steel wouldn't stand up in the curing furnace. Armco aluminized steel Type 1 solved the problem. Used only once, the aluminum-coated steel cells are much more economical than high-priced metal, and where formerly a man could remove 60 castings a day, he can now remove from 140 to 200.

Write No. 101 on Inquiry Card—Page 34

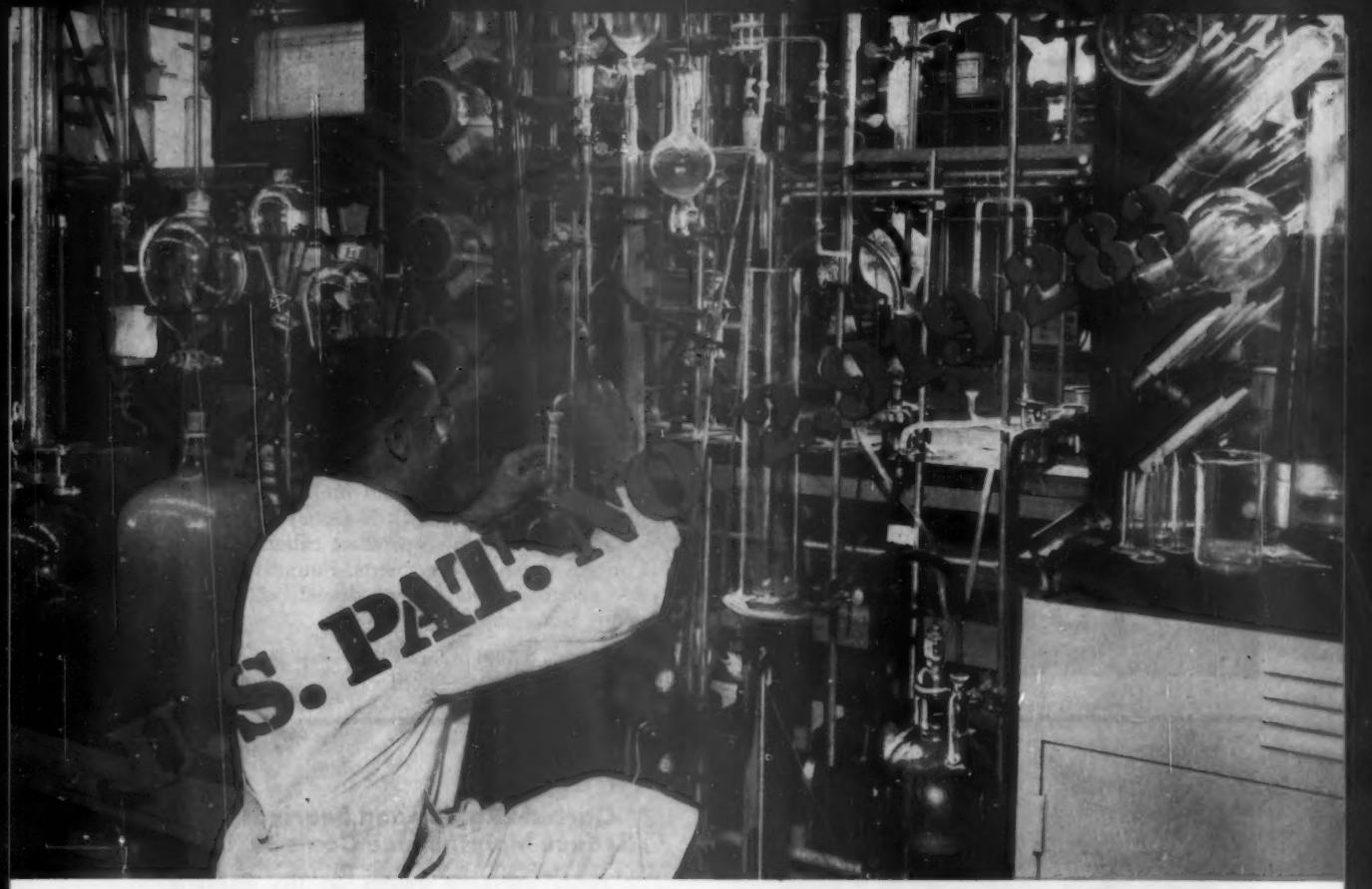


## **Non-Toxic Plastic Pipe Resists Corrosion and Wear in Food Plant**

Wayne Packing Co., Sodus, N.Y., reports that Koroseal PVC pipe has been moving eight to ten thousand gallons of fruit juices a day for nearly a year without citric acid corrosion or sign of wear. The juices are processed at 140 degrees F. As the pipe surface is highly polished, it will not support bacteria or permit particles to adhere to its surface.

Write No. 102 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 118 on Inquiry Card—pg. 34→



S. PAT.

## **Becco Granted Patent On In-Situ Epoxidation Using Ion-Exchange Resins as Catalyst**

Becco Chemical Division, Food Machinery and Chemical Corporation, has been granted U.S. Patent No. 2,919,283, covering in-situ epoxidation using ion-exchange resins as the catalyst. The process is an extremely practical and valuable one. As evidence, consider that millions of pounds of epoxy plasticizer have already been produced, using this method, by prominent companies in the industry.

Issuance of this patent is additional evidence of Becco's leadership in the field of epoxidation. (A license to use this process is offered to you by Becco; write for details.)

If you have an interest in this area, perhaps Becco's experienced Sales Engineers and research chemists can help you. Write us, outlining your problem. Complete confidence, of course. Address: Department PM-4.

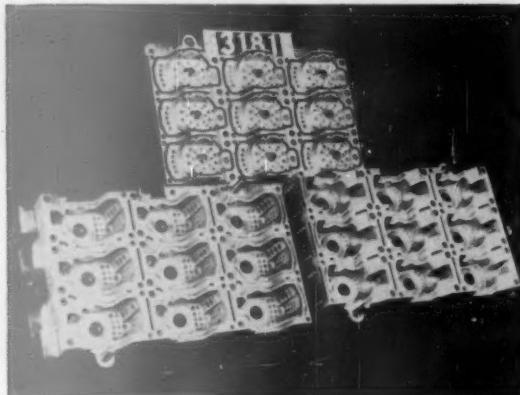


**BECCO BECCO**

**BECCO CHEMICAL DIVISION**  
Food Machinery and Chemical Corporation  
Station B, Buffalo 7, New York



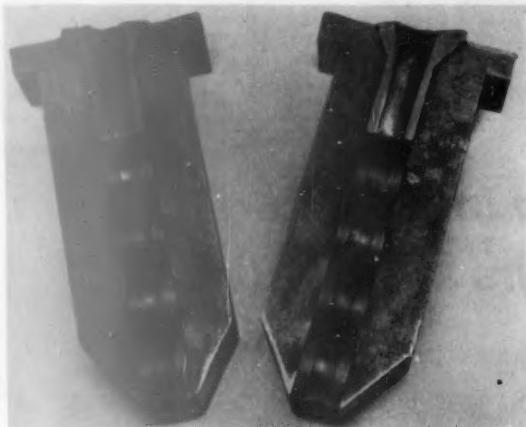
# V VALUE ANALYSIS A **Materials**



## New Core Box Sealing Method Reduces Castings Cost

Foundries often experience "blow-by" when blowing sand, under pressure, into core boxes. This erodes the box or parting faces and may cause flaws in the finished casting. The only protection is a tight seal—flexible, yet tough enough to resist live steam, alkali and fuel oil used during cleaning of the boxes. B. F. Goodrich's Hycar nitrile rubber, used in a product called Dike-O-Seal, meets these requirements. Foundries using it have reduced costs and produced better castings with less scrap.

Write No. 104 on Inquiry Card—Page 34



## Carbide Rollers and Bearings Reduce Maintenance Costs 80%

For roller entrance guides on the finishing stand of a wire mill, International Nickel's Huntington (W. Va.) plant switched to carbide guide rollers and unlubricated conical bearings. The new rollers outlast steel rollers 20 times, and have reduced maintenance costs by 80%. Quality of wire and rod has been improved by elimination of scratching caused by the steel rollers. The new rollers are made of Kennametal's Kentanium, a titanium carbide composition.

Write No. 105 on Inquiry Card—Page 34



## High-Nickel Alloy Prolongs Life Of Exchanger Tubes

Heat exchangers used in a "hot" hydrazine separation process at Fairmount Chemical Co., were originally equipped with steel alloy tubes. Tube bundles had to be pulled and replaced every six months. The heat exchangers were re-equipped with Patterson-Kelley high-nickel alloy tubes and a unique baffle system which provides even distribution of heat to prevent solids from caking and plugging tubes. The new tubes have been in use three years and none have been replaced yet.

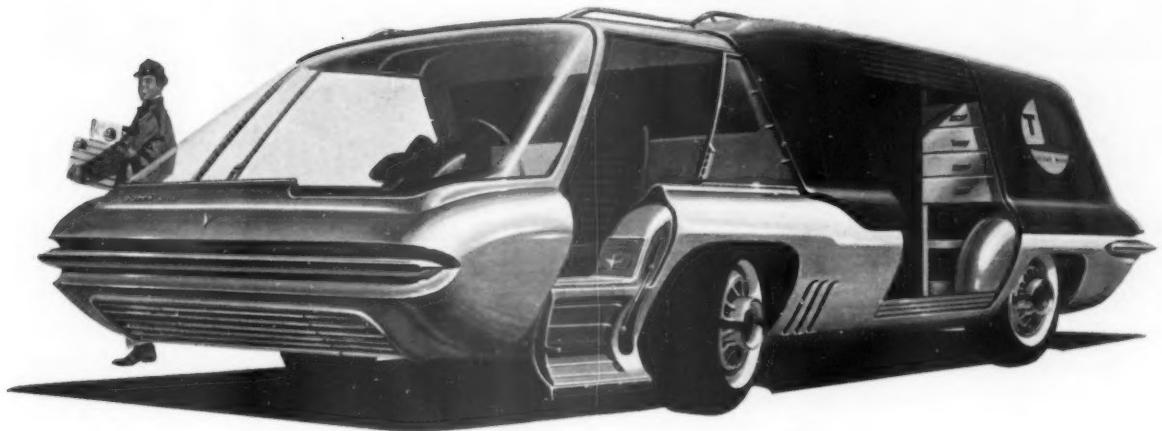
Write No. 106 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 107 on Inquiry Card—pg. 34→

## **stainless steel**

No other metal has the strength, beauty and versatile qualities that serve you so well today and promise so much for tomorrow.

**There is nothing like  
stainless steel for  
THE AUTOMOTIVE INDUSTRY**



McLouth Steel Corporation,  
Detroit 17, Michigan

*Manufacturers of high quality  
Stainless and Carbon Steels*



Look for the **STEELMARK**  
on the products you buy.

**McLOUTH STAINLESS STEEL**



## how to get the most for your chemical dollar

When your operations call for limited, varied or irregular chemical supply, your local distributor of Olin Mathieson chemicals is a good man to know. He can provide you with chemicals you need quickly and economically. He can also help you with technical problems that may arise.

If your operation is such that you can schedule the regular use of large quantities of chemicals, it is to your advantage to take direct shipment from the nearest Olin Mathieson plant. Most often, however, services of producer and distributor complement each other in providing you

with a coordinated chemical supply tailored to your requirements.

We will be glad to recommend a specific purchasing pattern to fit your requirements. For a discussion date or the name of your local Olin Mathieson distributor, please write.



**Olin Mathieson**  
Chemicals Division • Baltimore 3, Md.



Trisodium Phosphate • Trisodium Phosphate Chlorinated • Sodium Tripolyphosphate • Tetrosodium Pyrophosphate • Sodium Hexametaphosphate  
Monosodium Phosphate • Disodium Phosphate • Sodium Acid Pyrophosphate • Tetrapotassium Pyrophosphate • Sulfuric Acid • Hydrofluoric Acid  
Sodium Silicofluoride • Sodium Fluoride • Teox® 120 Surfactant

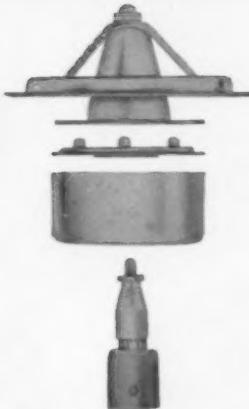


Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Soda • Chlorine • Formaldehyde • Hydrazine and Derivatives • Hypochlorite Products  
Methanol • Muriatic Acid • Nitrate of Soda • Nitric Acid • Soda Ash • Sodium Chlorite Products • Sodium Methylate • Sulfur (Processed)  
Sulfuric Acid • Urea • Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Ethanolamines • Glycol Ethers • Surfactants • Ethylene Dichloride

For More Information Write No. 108 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 109 on Inquiry Card—pg. 34→  
**PURCHASING**

# AGAIN-



EXPLODED VIEW OF AUTOSTAT® made by FULTON SYLPHON DIV., Robertshaw-Fulton Controls Co., shows impact extruded cup made from Revere Copper Rod. Other parts of this superior thermostat used in pressurized cooling systems in automobiles and other automotive equipment, are made of 70/30 Revere Brass Strip.

## Revere helps "fit the metal to the job"

AND A LEADING MANUFACTURER OF AUTOMOTIVE THERMOSTATS IS ABLE TO PRODUCE A SUPERIOR PRODUCT FOR LESS MONEY

That little unimportant-looking copper cup shown above originally posed a king-sized production problem. It is a critical part of a newly designed automotive thermostat made by the Fulton Sylphon Division of the Robertshaw-Fulton Controls Co., Knoxville, Tenn.

In the early stages this copper cup was machined from free cutting copper rod, but this proved costly due to the high rate of scrap from the machining operation and the relatively high cost of turning out the machined part. At this point Revere Technical Advisors got together with Fulton Sylphon Engineers and the possibility of an impact extrusion was discussed. Revere T.A.'s in turn contacted suppliers who might furnish these extrusions in copper, to see whether or not they could be produced economically and to the demanding specifications required.

After exhaustive tests it was found that the cup could be impact extruded to meet the exacting hardness specifications of Fulton Sylphon. During its development, many problems involving temper, grain size and control of the chemical composition of the copper rod had to be solved.

In addition to the Copper Cup, Revere also supplies 70/30 Brass Strip from which other parts of the AUTOSTAT® are fabricated.

Said a Fulton Sylphon purchasing agent, "When you ask Revere for help you really get results."

This is still another case of how Revere, a supplier, working with still another supplier, was able to help its customer produce a superior product for less money. Why don't you take advantage of this service?



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue

New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles, Riverside and Santa Ana, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.



## JIM SMITH IS BUILDING YOUR 1970 CAR

Pressed for a prediction, Jim Smith says you may be driving an "all-aluminum car" by the mid-70's. It's one of the things Alcoa's Development Division is working on, hand in glove with Detroit, from power plant to chassis and body. Take aluminum engines — Jim and the 49-man crew in the Development Division's automotive laboratories helped put them on the road. They laid the groundwork for a workable rocker arm . . . explored ways to let pistons

and rings run directly on aluminum cylinder walls . . . confirmed previous conclusions that the aluminum engine can use lower octane fuel than cast-iron engines. Credit them, too, for a key assist in developing the aluminum radiators, bumpers, transmission housings and combination hub-wheel-brake drums in use on famous-name cars and trucks.

Like Jim Smith, 93 other Development Division engineers and designers share their aluminum knowledge with

manufacturers of a wide variety of new consumer, military and industrial goods — diesel engines, compressors, missiles, army tanks, farm equipment, portable power tools, appliances and scores more. It's a service unmatched by any other light metals company and it's yours to call on — one more added value we put into every pound of Alcoa® Aluminum you buy. Aluminum Company of America, 2017-E Alcoa Building, Pittsburgh 19, Pa.

**ALCOA ALUMINUM**  
helps you design it, make it, sell it



## Alcoa has hundreds of Jim Smiths to help you design it, make it, sell it

All of Alcoa's skills are mobilized to a single purpose: To put more than just 16 ounces of metal in every pound of Alcoa Aluminum you buy. Here are 12 of the dozens of ways to do it:

1. **Research Leadership**, bringing you the very latest in aluminum alloys and applications.
2. **Product Development** by specialists in your industry and your markets.
3. **Process Development Labs** for aid in finishing, joining and fabricating.
4. **Service Inspectors** to help solve production problems at your plant.
5. **Quality Control** to meet top standards or match your special needs.
6. **Complete Line** including all commercial forms, alloys, gages, tempers.
7. **Availability** via the nation's best stocked aluminum distributors.
8. **Foremost Library** of films and books to help you do more with aluminum.
9. **Trained Salesmen** with a wealth of on-the-spot information.
10. **Sales Administrators** constantly on call to service your orders.
11. **Year-Round Promotions** expanding your old markets, building new ones.
12. **The Alcoa Label**, leading symbol of quality aluminum, to mark your goods.

### Added Values With Alcoa Aluminum

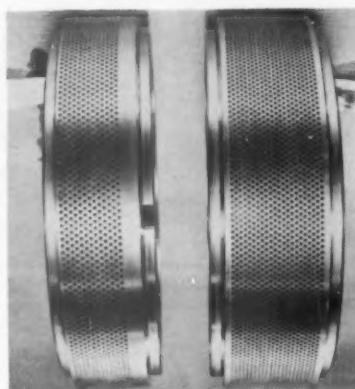


... is a case book of Alcoa special services and a guide to their availability in design, manufacture and sales. Your copy, with some of the most rewarding information you may ever read, is waiting and it's FREE. Write: Aluminum Company of America, 2017-E Alcoa Building, Pittsburgh 19, Pa.

For More Information Write No. 110  
on Inquiry Card—Page 34

MAY 23, 1960

## Special Alloy Doubles Life of Pellet Mill Die



Corrosion of pellet mill dies at various plants of Wirthmore Feeds, Inc., was causing a maintenance problem. Analysis over a 5-month period showed use of 38 dies, averaging less than 1000 tons of production per die, or a cost of \$.40 per ton. An alloy developed by Sprout, Waldron & Co. increased die life to an average of 7000 tons. Die costs have dropped to \$.1061 per ton. Inventories have been cut and pellet quality improved.

Write No. 266 on Inquiry Card—Page 34

## Lighter Alloy Improves Heat Exchanger Fins

Ramco Manufacturing and Engineering, Portland, Ore., is producing improved heat exchanger fins for less money after switching from alloy 3003-H14. The metals division, Olin Mathieson Chemical Corp., suggested 5005-H34 which yields more parts per truckload. A 1% difference in density means a 1% material saving, and the 5005 gives a 26% increase in thermal conductivity. Fewer or smaller fins therefore do the same heat-exchange job.

Write No. 267 on Inquiry Card—Page 34

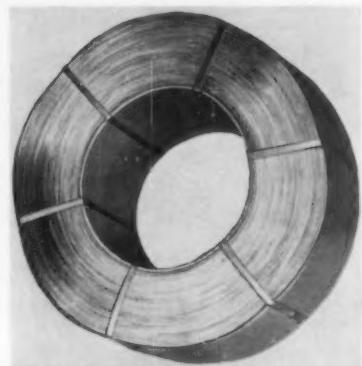
## Self-Curing Zinc Coating Halves Application Time

A new inorganic zinc coating—Zinkote—can be applied in half the time used previously for similar coatings, since it cures itself to full hardness and there is no need for applying a separate curing solution. It is applied over

bare steel by brush, spray, or roller. A single coat only a few mils thick protects against water, weathering, salt spray and abrasion. Film thickness is not critical. The coating is made by Amercoat Corp.

Write No. 268 on Inquiry Card—Page 34

## Giant Wire Coils Save Storage Space



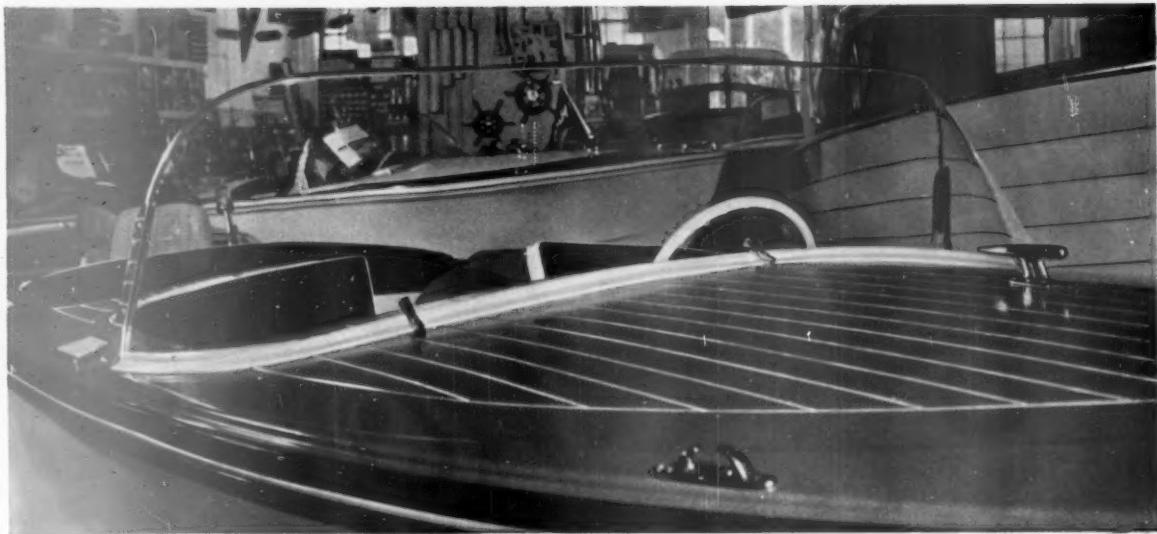
One-thousand-pound coils of continuous phosphor bronze wire have proved a time and space saver for the Lindsay Wire Weaving Co., Cleveland. Formerly, the firm welded together smaller reels of wire for redrawing. The large coils have made possible better use of storage space, elimination of welding operation, and less tangling of wire. The 1000-pound coils are produced by the Riverside-Alloy Metal Div., H. K. Porter Co., Inc.

Write No. 269 on Inquiry Card—Page 34

## Rugged Hose Withstands Chemicals and Abuse

For four years, Petrochem hose has held up in a rugged chemical environment at the Potlatch Forests Inc. pulp and paper mill. It has outlasted other hose 16 times in areas where it is exposed to lime rock, salt cake, acids, and caustics. Although outdoor humidity turns salt cake on the hose into corrosive substances, it has never been washed or refolded. Ordinary hose must be refolded periodically to prevent cracking at the folds. Petrochem is made by Thermodiv., H. K. Porter Company, Inc.

Write No. 270 on Inquiry Card—Page 34



Handsome and Hardworking  
**Plexiglas...Implex**



Strong, gleaming, curved PLEXIGLAS® windshields on pleasure craft . . . rugged, colorful IMPLEX® housings for outboard motors (with molded PLEXIGLAS insignia) . . . both give merely a hint of the wide range of uses being made of these Rohm & Haas plastics. What do *you* have in mind? Signs . . . lenses . . . lighting diffusers . . . glazing . . . machine parts . . . housings . . . nameplates? Better look into PLEXIGLAS acrylic plastic or IMPLEX, the high-impact acrylic. Our design staff and technical representatives will be glad to tell you how these Rohm & Haas products can help you.

For More Information Write No. 111 on Inquiry Card—Page 34



In Canada: Rohm & Haas Company of Canada, Ltd.,  
West Hill, Ontario

Chemicals for Industry  
**ROHM & HAAS**  
**COMPANY**  
WASHINGTON SQUARE, PHILADELPHIA 5, PA.

PURCHASING



## Materials

VALUE ANALYSIS



### Switch to Teflon Hoses Ends Failures on Air Lines

High temperatures caused hoses serving as air lines on automatic stacking machines in Knox Glass, Inc. to bake out after only a few months of service. New Aeroquip hoses of Teflon were installed on the machines, which feed jars to an annealing furnace conveyor. The new hoses have been used constantly for a year without a single operating problem or failure.

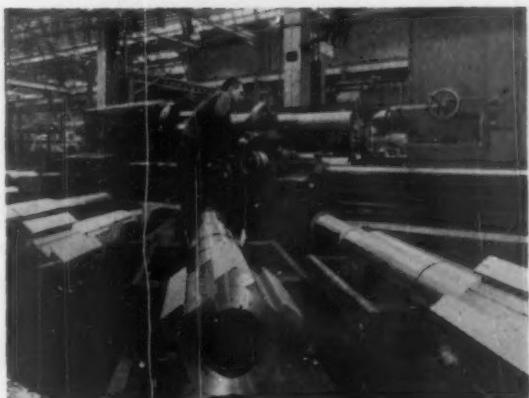
Write No. 112 on Inquiry Card—Page 34



### Machine Tool Maker Saves Three Ways With Leaded Steel Bars

Warner & Swasey Company changed to ALCO Products' Hi-Qua-Led (leaded steel) annealed forged bars to make tool holders for automatic chucking machines. Carbon steel forged bars had previously been used. The company reports these improvements: machining time has been reduced about 50%; difficult operations such as deep-hole trepanning are easier to perform; tool life is significantly increased—as much as five times in trepanning, for example.

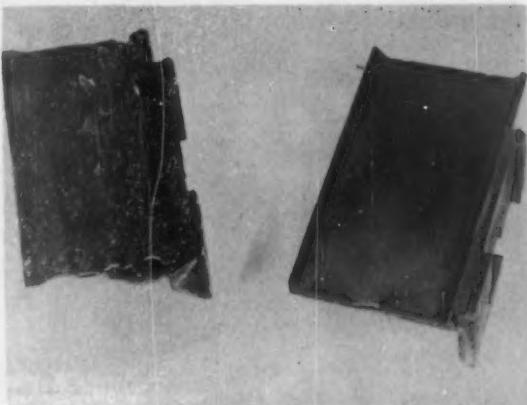
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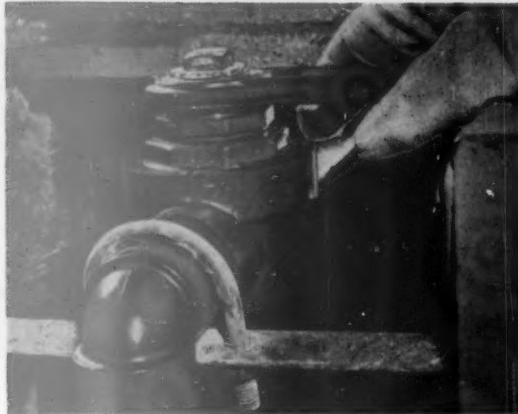
### Carbide Grit Throwing Blades Outlast Steel 50 to 1

Blades that throw steel grit in shot blasting machines are designed to be replaceable because of the beating they take. But the frequency of replacement is still a problem. For this reason, an Ohio foundry, where alloy steel blades often lasted less than 20 work shifts, has changed to tungsten carbide throwing blades. After 5453 hours of service, the foundry expects to get several thousand more hours from the carbide blades. The wheel on which the blades are used has also lasted longer, three years instead of six months.

Write No. 114 on Inquiry Card—Page 34



## Materials



### Polyvinyl Pipe and Fittings End Valve Destruction

A 93.19% solution of sulfuric acid used to eat up metal valves in less than five months at The Upjohn Company, pharmaceuticals manufacturer. Since switching to UPVC (unplasticized polyvinyl chloride) pipe and fittings four years ago, Upjohn has had no failures in this application. Pipe and fittings are molded by Tube Turns Plastics Inc.

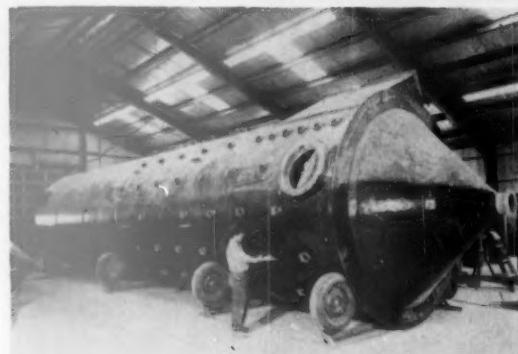
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### Urethane Outlasts Natural Rubber Three to One

After pumping 250,000 tons of abrasive slurry at the acid leach plant of Faraday Uranium Mines, a 12-inch natural rubber impeller was so badly worn that its metal frame was exposed to attack by acid. It was replaced with an impeller made with Du Pont's Adiprene, a resilient, abrasion- and chemical-resistant urethane rubber. The new unit has outlasted the previous one three times, and is still in good condition.

Write No. 116 on Inquiry Card—Page 34



### Reinforced Plastic Fume Scrubber Needs Little Maintenance

A giant chemical fume scrubber, over 47 ft. high and 10 ft. in diameter, was designed and engineered by the Buffalo Forge Air Cleaning Division for a metallurgical processing company. To handle corrosive fluoride fumes and mists, apparatus was made of Durez Hetron 92, a fiber-glass reinforced polyester plastic, which weighs about one-tenth as much as steel, is flame and corrosion resistant, and virtually eliminates maintenance.

Write No. 117 on Inquiry Card—Page 34

**"We've cut handling costs 50%..."**



# "...and made a 15% overall savings

says Mr. George W. Smith, Plant Superintendent, Barnard & Leas Manufacturing Company, Inc., Cedar Rapids, Iowa



"We used to order 60% of our materials from the mill, and 40% from a steel service center," says Mr. Smith. "But during the recent steel strike, we looked closely at our inventory situation. After a thorough study, we revised our operation completely. We now order 70% from a steel service center and 30% from the mill."

"We had a scrap problem when we ordered from the mill, because we had to process the materials. The scrap had to be handled and stored until we had enough to market. Today, we order wide flange beams, angles and channels, plate, sheet, and bar size flats and angles direct from U.S. Steel Supply, and they're delivered *pre-cut to the exact shape and size*.

"This saves time and we don't have to invest in expensive machining equipment. And here's another point: the quick and reliable service we get from U.S. Steel Supply has more than once allowed us to accept an urgent order for a piece of heavy equipment.

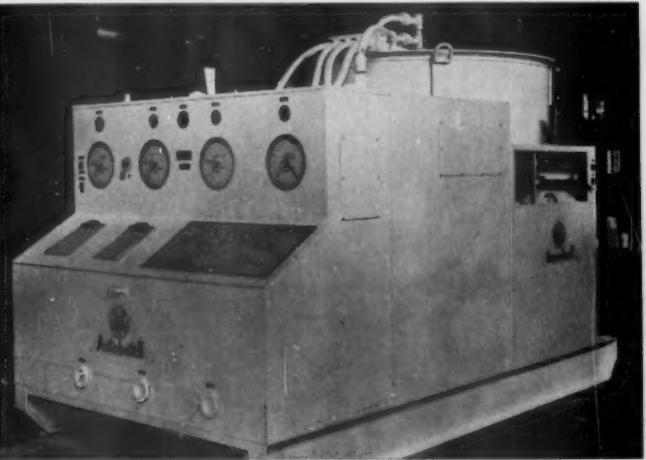
"For instance, our associate company, Transport Trailers, Inc., was asked to build a 100-ton trailer to transport oil in the North African desert—this job demanded a tough, durable trailer. *We had one month to build it.* Immediately, we called U.S. Steel Supply, gave the order, and explained the

urgency of the situation. Two days later, the material arrived pre-cut to the specified sizes. *We met the deadline.* The mill would've taken two or three months to deliver this order, and we'd still have had to cut the material to size.

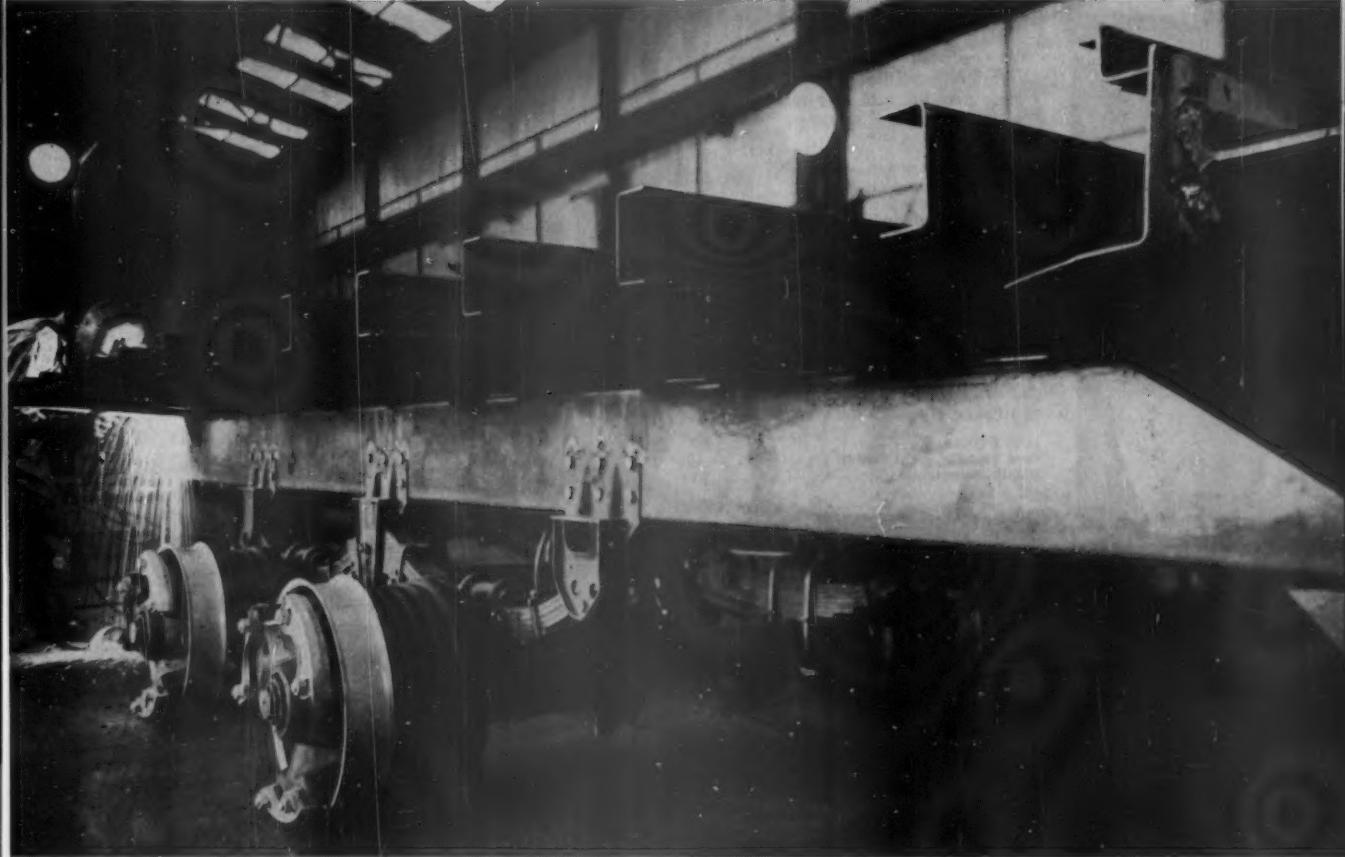
"About 60% of our production is directed to the individual customer's requirements. That's because we produce custom-made trailers. Now, several laws govern trucking throughout the United States. These laws dictate a truck's width, the number and arrangement of its axles, and its load-carrying capacity. Mountain states have special regulations for brakes and wheel types. For these reasons, we never know what specifications will be required in the next order. We have to purchase steel in small lots *as it's needed . . . where it's needed . . . pre-cut to size.*"

This account of how one company made substantial steel savings might never have happened, if Barnard & Leas Plant Superintendent, George Smith, hadn't taken the time to attend one of U.S. Steel Supply's Value Analysis Slide Presentations. But he did. And he became interested enough to take a long, cold look at his own steel-buying policies. Are you interested in the advantages of U.S. Steel Supply's Value Analysis Program? **Use the coupon on the following page.**

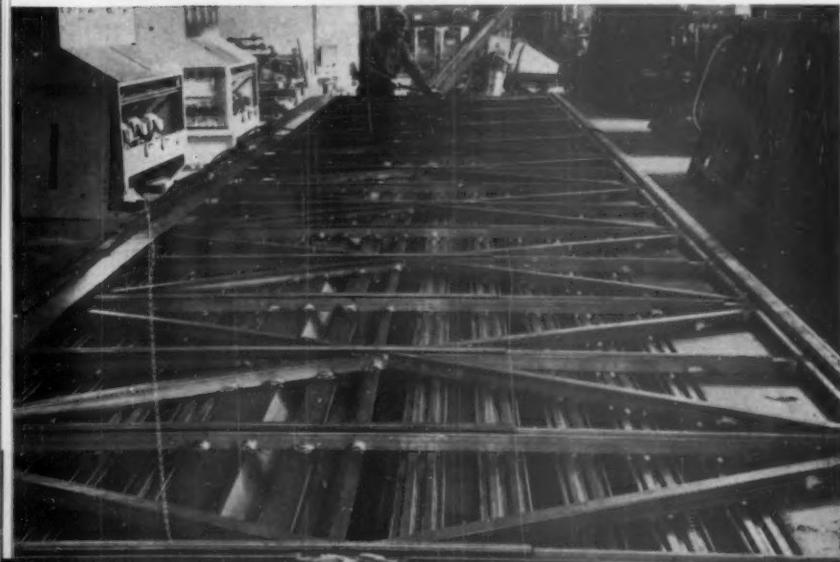
"Our company was founded a century ago to make grain processing equipment. Here are some components for a liquid fertilizer processing plant . . . and here is the finished product."



# by dealing with U.S. Steel Supply."



"Our production ranges from processing machinery to trailers. This includes lowbeds, platforms, livestock, grain and special trailers. This man is working on the bed of a livestock trailer. This finished truck body is a completely mobile formula feed blender . . . an excellent example of our production work."



# Here's how Value Analysis worked for these U.S. Steel Supply Customers:



"We reduced capital investment, eliminated scrap loss, slashed inventories, and brought our goal for a 60-day inventory turnover within range."

**Robert W. Boldt, Purchasing Agent**  
Borg-Warner Industrial Cranes  
Ingersoll Products Division  
Borg-Warner Corporation



"We consider U.S. Steel Supply's pre-cutting service a valuable asset. On one contract last year, this service sliced our labor costs 5%, or \$12,500, by maintaining production schedules."

**Albert O. Wilson, Jr., President**  
A. O. Wilson Structural Company



"U.S. Steel Supply stocks a variety of material in 20 steel service centers located strategically all over the country. That's our guarantee against costly work delays!"

**John Ziembra**  
Cook Technological Center  
Missile Components



"We reduced our inventory and made an additional 10,000 square feet of space available for production facilities."

**James H. Dray, President**  
Dray Manufacturing Company



"Thanks to U.S. Steel Supply's prompt, efficient service, we plan to slice our steel inventory in half, and use the additional working capital for a wide-range car-reclaiming and rebuilding program."

**Harold A. Berry**  
Manager of Purchases and Stores  
Chicago, Rock Island & Pacific  
Railroad Company



"We eliminated mill 'lead time' and solved our 'dead inventory' problems. U.S. Steel Supply also helped us whittle a space-robbing inventory down to size."

**C. R. Campbell, Materials Manager**  
Rohr Aircraft Corporation

**Fill in this coupon and send for your free Value Analysis Folder** U.S. Steel Supply has prepared a form that may help you find the cost of maintaining your present inventory. It includes a number of cost items that should apply to your operation, and you may be able to add several others. Ask for this form—and when you receive it, be sure to pass it on to your cost control department and have them fill in your costs item by item. Then call your local U.S. Steel Supply representative for a comparative price run-down on material and special services. We think you'll find that U.S. Steel Supply will be able to show you how to reduce costs and increase profits.

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Title .....

Company Name .....

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Division of  
United States Steel



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General Offices: 208 South LaSalle Street, Chicago 4, Ill.

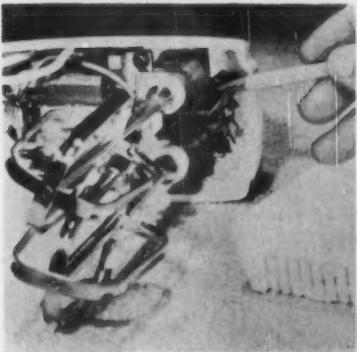
**Stainless Clad Chutes  
Save \$35,980**



At the Salem Harbor Station of the New England Electric System, stainless-clad chutes cost \$8150 versus \$5850 in carbon steel. But in the first five years amortized costs are \$13,400 for stainless and \$19,960 for carbon steel chutes (including maintenance, depreciation, tax, insurance and interest). In second five years savings run \$14,710 in favor of stainless: over 15-year effective life savings total \$35,980.

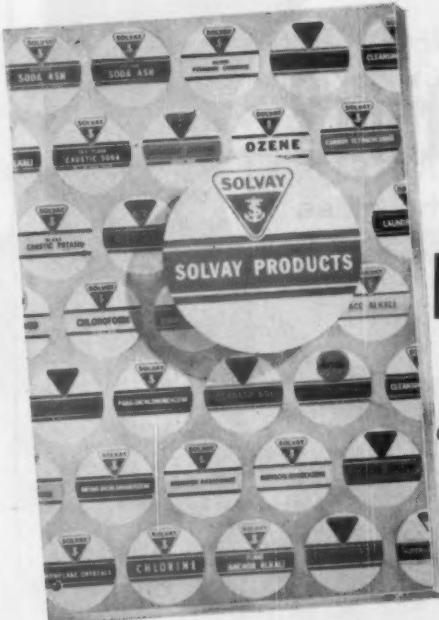
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**Filled Nylon Gears  
Outlast Regular Type 2:1**



Molybdenum disulphide filled nylon drive gears on beater shafts of household mixers have increased gear life 70 to 100%, reports the Iona Manufacturing Co., Manchester, Conn. The new gears replace moldings of standard unfilled nylon 66. Improvement in wear life was made at an additional cost of only 5%. Molybdenum-filled nylon molding powders are supplied by the Polymer Corp., Reading, Pa.

Write No. 272 on Inquiry Card—Page 34



**This  
CHEMICAL  
PURCHASING  
GUIDE  
“talks” P.A.’s  
language!**

Here . . . in this easy-reading, non-technical guidebook . . . are all the facts you need about Solvay® industrial chemicals before you buy.

You'll find concise information on uses, physical properties, grades, containers, handling. 61 pages of valuable data skillfully indexed to help you quickly locate any product in the extensive Solvay line . . . soda ash, caustic soda, chlorine, special alkalies, ammonium and potassium products, hydrogen peroxide, chlo-

romethanes, chlorobenzenes, calcium chloride, chromium chemicals.

This practical information is based on over 75 years of close work with such leading industries as . . . paper, textile, glass, leather, metal finishing, chemical processing. Mail the coupon for your free guidebook.

**Refer to our listings in Thomas' Register, Chemical Materials Catalog, Chemical Week Buyer's Guide.**



**SOLVAY PROCESS DIVISION**  
61 Broadway, New York 6, N. Y.

76-50

**SOLVAY PROCESS DIVISION**

Allied Chemical Corporation  
61 Broadway, New York 6, N. Y.

Please send your guidebook, "Solvay Products."

Have your representative call.

Name \_\_\_\_\_

Position \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

For More Information Write No. 119 on Inquiry Card—Page 34

# Creating?

Leave the glass  
to Lancaster...



design flexibility in glass

If your new design needs components of glass or plastic, you've come to the right place. Lancaster engineers work with you in the brainstorming phase, then go off by themselves and produce. A few days later, you get designs and details on parts, production and costs. Result: more effective planning, and a brighter future for your product. Write or phone Lancaster Glass Corporation, Lancaster 4, Ohio. OLIVE 3-0311.

For More Information Write No. 120 on Inquiry Card—Page 34

## Alloy Steel Gives Disc Plates Longer Life



Union Dock Co. had been using hopper disc plates of premium manganese in handling iron ore. The plates, which are subject to extreme abrasion and impact, were serviceable for only two years. Union changed to Jalloy heat-treated special alloy steel plates supplied by Jones & Laughlin Steel Corp. The new plates are half the price of the old and last for three years. They also take hard surface welds much more easily.

Write No. 273 on Inquiry Card—Page 34

## Plastic Spiral Makes Hose Strong, Spark-Proof



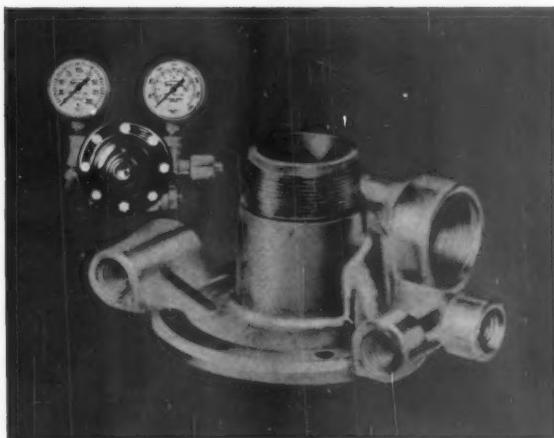
Faced with the need for a rubber suction hose that had to be kink-proof, strong, corrosion resistant, and spark-proof, the Goodall Rubber Co., Trenton, N. J. turned to W. R. Grace's Grex. The high-density polyethylene, in the form of a spiral, replaces conventional wire reinforcement. The hose can be used in extremely rugged conditions and where dust and gases may create explosive hazards.

Write No. 274 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 121 on Inquiry Card—pg. 34→ PURCHASING

# TAKE A FRESH LOOK

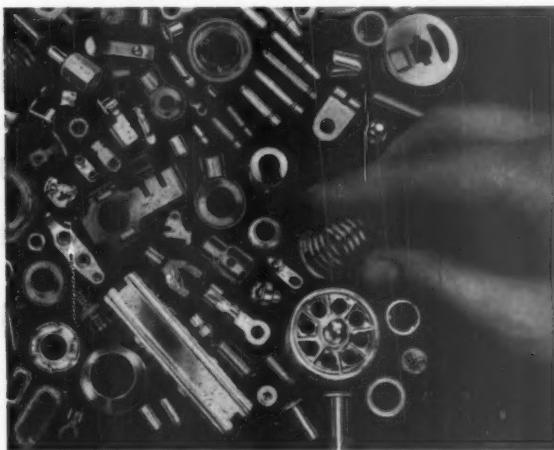
at the way you are fabricating metal parts. Cost-cutting possibilities are almost unlimited with these Anaconda pre-formed mill products and press products.



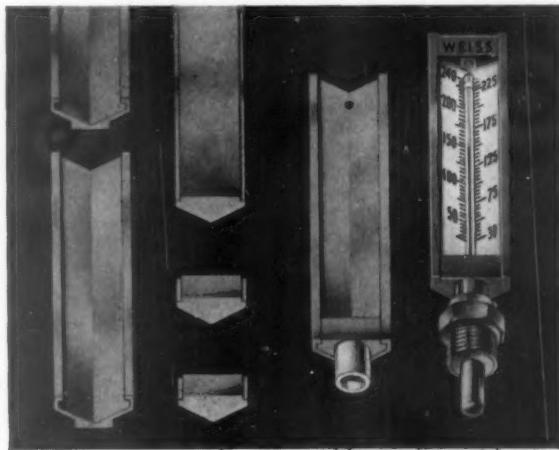
**DIE-PRESSED FORGINGS**, made of twice-wrought metal, offer superior uniformity, denseness, accuracy. *Savings:* replace more costly built-up assemblies—often are less in first cost than sand castings—require minimum surface machining to size—simplify secondary operations—lower tool cost—lower finishing cost.



**SPECIAL-SHAPE TUBES** can, as in the case of Electrolux, save several steps in arriving at a finished part. Brass electric-motor brush holder (above) is cut economically from long lengths of tube pre-shaped to accommodate both brush and spring. Uniform accuracy of all dimensions helps provide good brush stability.



**MULTIPLE-PLUNGER AND PROGRESSIVE-TOOL-PRESS PRODUCTS** are cutting costs throughout industry—often over 50%. Main reasons: The American Brass Company's complete design engineering service, long experience, specialized production equipment, a big selection of stock tools. Metals: copper, copper alloys, nickel, iron, steel, stainless steel, or aluminum.



**EXTRUDED SHAPES.** Wherever you fabricate from solid rod or bar—or castings—consider savings in machining, tooling and scrap by use of extruded shapes. Albert A. Weiss & Sons substituted two extruded shapes, above, for a sand casting—cut cost of thermometer case 41%, got an additional 30% saving in assembly because of consistently uniform dimensions.

HERE are four immediate approaches to cutting costs. Re-evaluate your designs and fabrication methods with these short cuts to finished products in mind. Wherever you spot a possible saving, send a sample, drawing, or description—with the quantity you need, the metal or properties you require—and ask for a quotation. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Limited, New Toronto, Ontario.

5853

**DIE-PRESSED FORGINGS • SPECIAL-SHAPED TUBES  
EXTRUSIONS • FABRICATED METAL GOODS**

*products of*

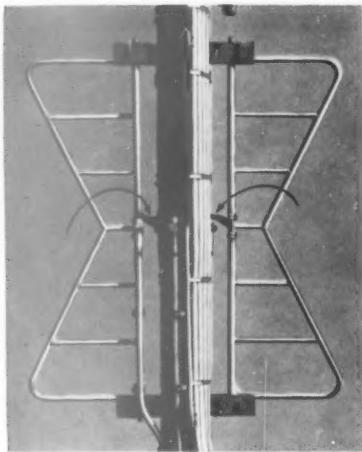
## ANACONDA®

*Made by The American Brass Company*

Anaconda metals—key to more precise control of value and cost

# TRY A FRESH APPROACH

Don't just take your metals for granted—specify the properties you need. The Man from Anaconda may come up with some very interesting answers.

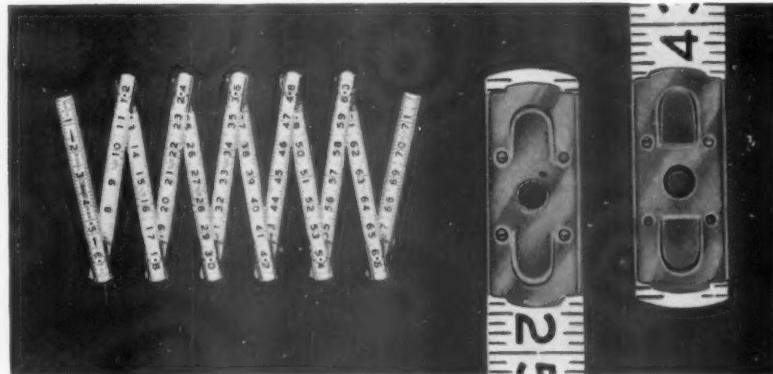


Up where T.V. broadcast antennas stand, normal wind causes flexing of metals. So jumpers between coaxial cables and radiators must be resilient—beside being conductors, giving some structural support. Ordinary phosphor bronze seemed adequate, but there were fatigue failures.



RCA listed desirable properties of phosphor bronze—added extra-high endurance, extra-long fatigue life. American Brass suggested Duraflex<sup>®</sup>, Anaconda superfine-grain phosphor bronze. RCA tried it, found it the answer—at no extra cost—specified Duraflex to the manufacturer, Dielectric Products Engineering Co., Inc., Raymond, Maine.

STARTING with 93 standard alloys, The American Brass Company can make minor variations in composition, fabrication, and annealing to provide an almost unlimited number of combinations of useful properties. When new or unusual problems arise, ask for the help of the Metallurgical Dept. in selecting the right metal. For such help or a copy of Publication B-32, "Anaconda Copper & Copper Alloys," write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario, Canada.



To stimulate sales of its top-quality folding rule, and to meet Navy specifications, Eagle Rule Mfg. Corporation sought a metal for rule joints that would resist wear and corrosion, and provide the proper spring tension. Phosphor bronze, which had these qualities in excess of needs, cost too much.

American Brass suggested three alloys. Eagle Rule chose Ambronze-420 (88 Cu, 11 Zn, 1 Sn) because rule joints of this alloy met all requirements, withstood 400,000 cycles in wear test (Navy required 7000). It cost only pennies per pound more than yellow brass, much less than phosphor bronze.



Technical Oil Tool Corp. asked Anaconda to help select the metal for a new magazine-type clip used to close surgical incisions. The metal had to provide the right tension to hold edges together, yet open easily—form readily, hold sharp die-cut edges, be proved in surgical use.



American Brass technical specialists suggested Nickel Silver, 18%-719 as best suited to meet all requirements. Auto-clip, shown in use above, is the result. Incisions are held together with least damage to tissues. Surgeons can work faster in applying and removing clips.

## ANACONDA<sup>®</sup>

COPPER • BRASS • BRONZE • NICKEL SILVER  
MILL PRODUCTS

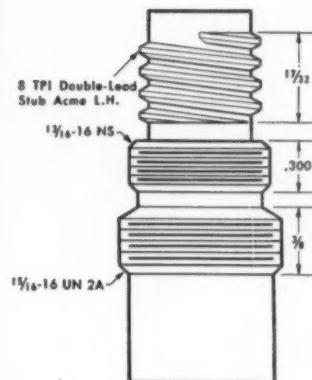
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5850

Versatile Anaconda metal products—for high total value and low total cost

# COST CUTTING

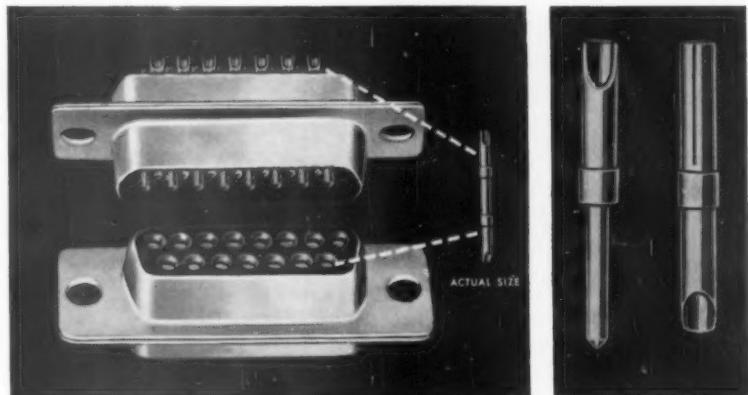
on tough jobs—like rolling a double-lead Stub Acme thread—may be easier than you think. Olson Mfg. Co. needed only a minor adjustment in a standard Anaconda rod



Rolling three threads (drawing, right) in two positions on a 6-spindle automatic meant cost savings for Olson Mfg. Co., Worcester, Mass. The Acme thread, however, posed problems. American Brass specialists suggested minor modification of standard Anaconda Free-Cutting Brass Rod to provide the extra ductility needed. The idea worked and the resulting valve spindle is shown above, about 1 1/2 times actual size.

**—or maybe you need a different alloy rod.**  
The tiny connectors, right, have to be machined from .078" rod, requiring many precision form-cutting, drilling, slotting operations. So machinability is a vital property of the rod used—but so are adequate electrical conductivity, high strength, and fatigue resistance.

Cannon Electric, Los Angeles, makers of these electrical plug assemblies, had to find a rod with a delicately balanced combination of mechanical properties to provide the unfailing and continuous performance required. They found it in Anaconda Free-Cutting Phosphor Bronze-610 Rod, developed by American Brass metallurgists to combine the strength, resilience, fatigue resistance of phosphor bronze, and machinability approaching that of free-cutting brass.



**M**EETING the joint requirements of designers, manufacturing men, and buyers—to achieve high quality and performance while simplifying fabrication and cutting over-all costs—is an important function of American Brass technical specialists. For imaginative and practical help of this kind, see your American Brass Company representative or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 5009

## ANACONDA®

COPPER • BRASS • BRONZE  
NICKEL SILVER • MILL PRODUCTS

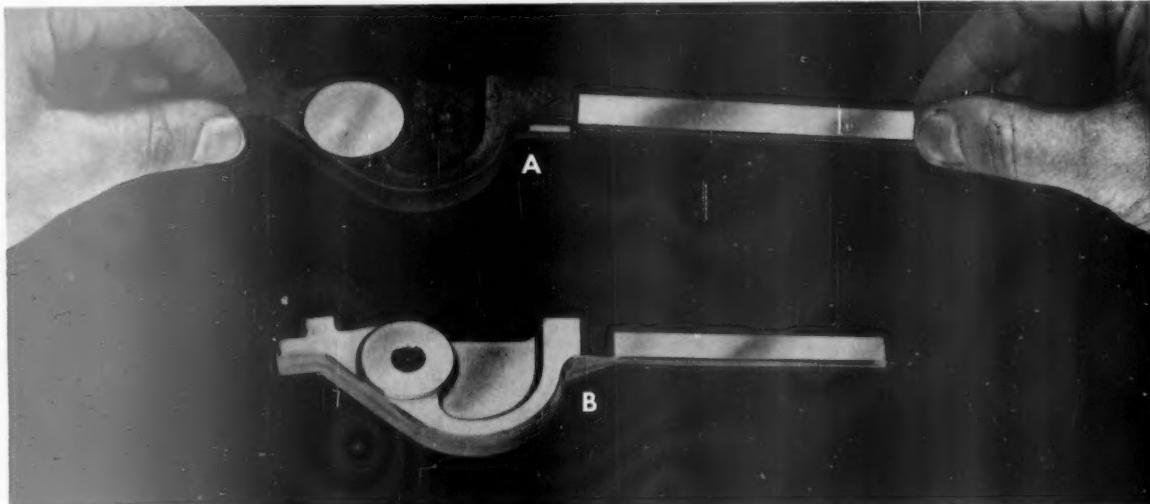
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Anaconda specialists can help you select the right metal for your job

# QUALITY CONTROL PLUS SAVINGS

Value analysis

suggested the use of a die-pressed forging. The result: an 85% cost reduction and a stronger, tougher part.



**SWITCH BLADE** in overspeed limiting device on large General Electric motor-generators was originally an assembly **A**—an arm brazed to a brass casting which was machined, slotted, and drilled. After review in the company's Value Analysis program, assembly was replaced by Anaconda die-pressed brass forging **B**.

The superior strength of twice-wrought metal made possible a one-piece part. The excellent finish and consistent dimensional accuracy of the die-pressed forgings eliminated all machining but the drilling operation. The over-all cost is 15% of the original part.

## These publications can help you make Value Analysis pay off

1. Anaconda Copper and Copper Alloys—composition and physical properties.
2. NEW Four free-cutting, high-conductivity coppers—physical properties, machining practices.
3. NEW Bulletins on high-strength heat-treatable alloys—Zirconium Copper, Chromium Copper, Leaded Nickel Copper, Cunisil-S37 (copper-nickel-silicon alloy).
4. Formbrite®, Anaconda superfine-grain drawing brass for reducing finishing cost.
5. Duraflex®, Anaconda superfine-grain phosphor bronze with superior endurance limit for better springs and spring parts, at no extra cost.
6. Machining Copper and Copper Alloys. Physical data and practical suggestions.
7. Rods for Screw Machine Products. Physical properties and constants.
8. Die-Pressed Forgings. Suggestions and ideas for saving money and making superior parts.
9. Anaconda Welding Rods and Procedures. A practical book on the welding of copper and copper alloys and the use of braze welding in repair and fabrication.
10. Corrosion Resistance of Copper and Copper Alloys—designed to assist the materials engineer in selecting the best alloy for a specific use.
11. Everdur® Metal—properties and applications of this important high-strength, corrosion-resistant family of copper-silicon alloys.
12. Anaconda Flexible Metal Hose and Tubing—connectors of all types, and Sealite®, Anaconda flexible, liquid-tight conduit.
13. Multiple-Plunger Press Products—catalog outlining variety of parts available—engineering and consulting service.

6061

**The American Brass Company**  
Waterbury 20, Conn.

Please send me literature indicated by the numbers I have circled below:

1 2 3 4 5 6 7 8 9 10 11 12 13

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COMPANY.....

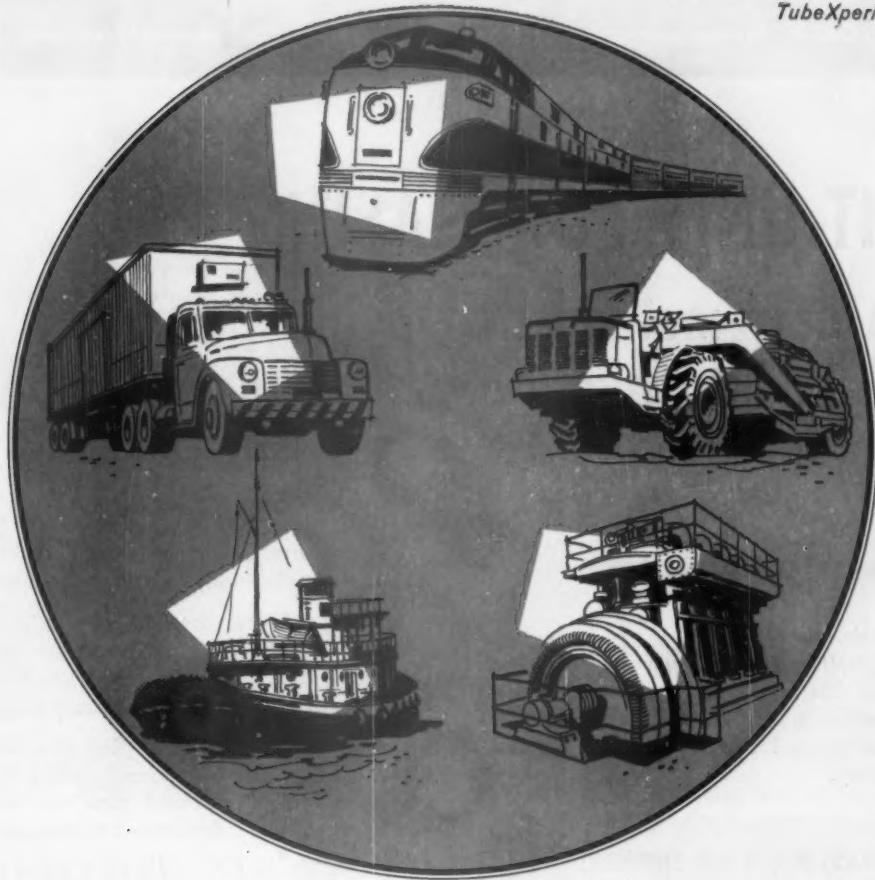
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## Feedlines for hungry horsepower . . . diesel fuel injection tubing by Superior

Fuel injection systems are the heart of thousands of diesel-powered trucks, locomotives, roadbuilding equipment, electric generators, and marine power plants. The tubing that conveys the fuel from injection pump to nozzle assembly is an important component. It must resist the stresses of pressure and vibration, yet be ductile enough to be cold swaged and upset and be cold formed into loops and bends without excessive springback. It must have a clean ID, tremendous burst strength, and high fatigue resistance. Superior diesel fuel injection tubing is just such a premium product.

Type C-1008 and Type MT-1010 carbon steel tubing are most commonly specified for this application, but alloy and stainless steel tubing for pressures above 9000 psi and greater corrosion resistance is available. Superior also makes tubing for many other applications—supplies both general and special purpose tubing for aircraft, missiles, electrical, electronic,

chemical, hydraulic, dairy and nuclear, to name a few. For complete information, write Superior Tube Company, 2034 Germantown Ave., Norristown, Pa.

### SOME REASONS WHY SUPERIOR FUEL INJECTION TUBING IS A PREMIUM PRODUCT

- It will handle pressures to 9000 psi, is hydrostatically tested to various pressures according to specification
- It is cold drawn, dead soft annealed, and seamless
- It is ID conditioned to remove fissures and other defects
- It is free from ID radial cracks deeper than .005 in. or 5% of wall thickness, whichever is less
- It is annealed at finish in controlled atmosphere furnaces to produce a soft, ductile and scalefree material
- Fracture tests are performed when requested

# Superior Tube

The big name in small tubing  
**NORRISTOWN, PA.**

*All analyses .010 in. to ½ in. OD—certain analyses in light walls up to 2½ in. OD*

**West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST**

For More Information Write No. 125 on Inquiry Card—Page 34

HAWKRIDGE announces new concept in purchasing

# PROFIT-UNIT PURCHASING— A new method that builds profit right into *every part* you manufacture

## ONE CODE-NUMBER ORDERS ALL PARTS

In essence, this is the concept.

You order, by *ONE simple code number*, all the bar, rod and/or sheet sizes needed for a *complete production unit* . . . which Hawkridge will have previously cut, prepared, wrapped, labeled by part number and placed in inventory!

## ONE UNIT ALWAYS READY FOR SHIPMENT

Hawkridge sales engineers, working closely with your purchasing and production executives will analyze your needs in order to develop and maintain coded lists of each individual part by number, quantity and dimension. We maintain a "revolving" inventory of these parts. Upon shipment of order, we repeat the process to prepare another "production unit package" against your future needs!

## FOR EXAMPLE . . .

Using this modern new Hawkridge Profit-Unit Purchasing method one customer orders 11,000 cut-to-length, ready to use steel bars in 43 different dimensions . . . by phone, in less than 30 seconds! Because the complete "package" is already prepared in our warehouse, the order is delivered in hours.

## PROFIT . . . BUILT INTO EACH PART, 5 WAYS

You profit by a lower cost at the point of use. Planned purchasing builds systematic savings. You actually build profitability into individual *parts* as well as in completed production units.

You eliminate "cost of possession" because Hawkridge maintains your inventory without extra charge.

All bars, rods and sheets are accurately cut to specified tolerances by experts. This greatly reduces *your* machining, time and labor costs, while it avoids odd-length inventory, eliminates unnecessary waste.

Remember, each individual piece of each production unit is *labeled for the operation for which it is required*. On delivery these individual parts can be easily and quickly routed to the department or machine where they will be used.

One order, one invoice. Purchasing time is reduced, clerical labor cut to the bare minimum.

**FOR COMPLETE DETAILS  
AND ANALYSIS, CALL YOUR  
NEAREST HAWK  
HEADQUARTERS TODAY!**

The latest example of:

"Keeping New England Industry Supplied Faster With Higher  
Quality at Lower Cost For Over 75 Years."

**HAWKRIDGE** BROTHERS COMPANY  
*SERVICE* Center for Metals

BOSTON, MASSACHUSETTS • WATERBURY, CONNECTICUT





## Custom Made OSTUCO Tubing ..... gets your product off the ground

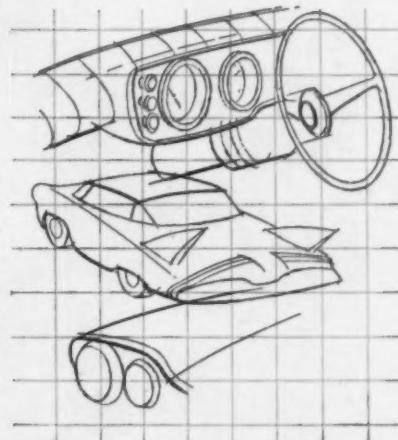
OSTUCO tubing is the exact tubing you need for your product because OSTUCO Tubing is CUSTOM MADE for your product. Your order is manufactured to your own specifications to produce steel tubing especially for your application—the precise grade, analysis, size, shape, special anneal and tolerances best suited to your own needs.

Ohio Seamless Tube produces both seamless and electric welded steel tubing—is prepared to form many finished or semi-finished tubular parts to your designs.

To get the most from your next steel tubing order, use Custom Made OSTUCO TUBING. Contact your nearest Ohio Seamless representative, or send part drawings to the plant at Shelby, Ohio—Birthplace of the Seamless Steel Tube Industry in America.

Model illustrated built to 3.5 mm scale.

SEE US AT BOOTH 629—DESIGN ENGINEERING SHOW  
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Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

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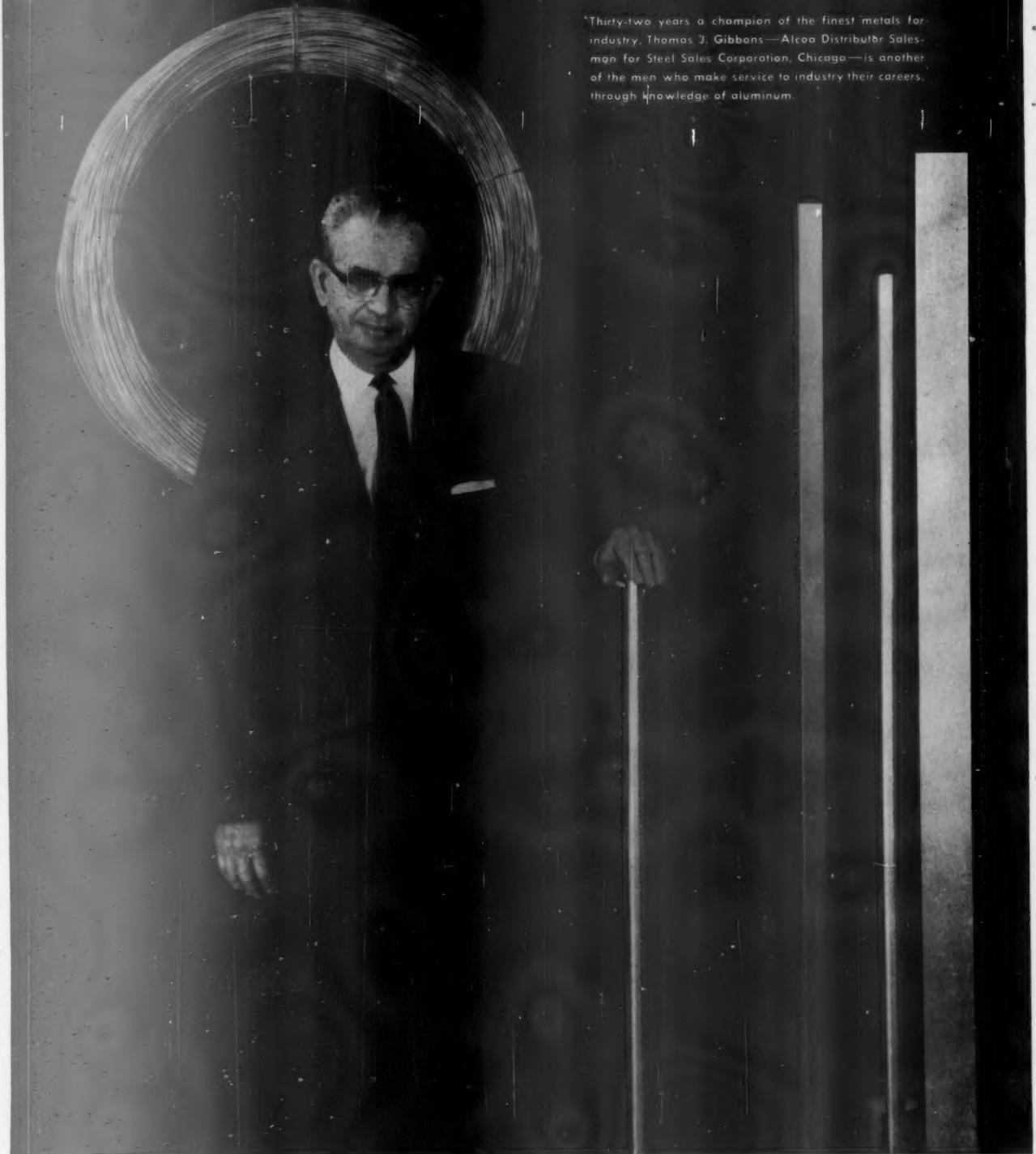
CANADA: Railway & Power Engr. Corp., Ltd.

EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

For More Information Write No. 127 on Inquiry Card—Page 34

# The Aluminum Man\*

Thirty-two years a champion of the finest metals for industry, Thomas J. Gibbons—Alcoa Distributor Salesman for Steel Sales Corporation, Chicago—is another of the men who make service to industry their careers, through knowledge of aluminum.



# He supplies your wire, rod and bar... fast

*Alcoa® Aluminum Wire, Rod and Bar... light in weight, easier to handle, and offering you important cost advantages... is now readily available from local warehouse stocks. You can now receive immediate "from-stock" delivery of a wide variety of sizes, shapes and alloys from your local Alcoa Distributor Salesman—The Aluminum Man!*

He can deliver fast—and he can supply solutions to your problems fast, too. Call on *The Aluminum Man* for

anything concerning aluminum. He can give you specifications, technical data and many valuable suggestions. His advice and help, reflecting the treasure of technical knowledge amassed by Alcoa, the aluminum pioneer behind these products, are yours for the asking. Always specify *Alcoa Aluminum*—the light metal with the bright future that's being seen in more places—more and more! Aluminum Company of America 936-E Alcoa Building, Pittsburgh 19, Pa.

Call *The Aluminum Man*. He's your Alcoa Distributor Salesman for aluminum wire, rod and bar, tube and pipe, sheet and plate and all Alcoa Mill Products.



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\*Central Steel and Wire Co.  
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\*The Corey Steel Co. (Bishop 2-3000)  
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Steel Sales Co. of Indiana, Inc.  
(Liberty 6-1535)

**KANSAS**  
Wichita  
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St. Louis 14  
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Buffalo 7  
Brace-Mueller-Huntley, Inc.  
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Edgcomb Steel Co. (Franklin 5-3361)  
Greensboro  
Edgcomb Steel Co. (Broadway 5-8421)

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Central Steel and Wire Co.  
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Cincinnati 29  
Williams and Company, Inc.  
(Capitol 1-3000)  
Cleveland 2  
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### OKLAHOMA

Tulsa 13  
Metal Goods Corp. (Temple 6-2561)

### OREGON

Portland 9  
\*Pacific Metal Co. (Capitol 7-0693)

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### YORK

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Edgcomb Steel of New England, Inc.  
(Poplar 7-0900)

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Central Steel and Wire Co.  
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### MILWAUKEE 9

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For More Information Write No. 128 on Inquiry Card—Page 34

# "CALL FOSTER... THEY'LL SHIP PIPE PLUS"



Right! Whether it's a routine order or an emergency request for unusual or hard-to-get sizes, Foster gives you pipe "plus."

You get all your pipe when and where you need it, cut to length or fabricated in complete-package shipments, at lowest possible cost.

For non-pressure applications, check the unusual savings on Foster Structural Pipe. Foster's nationwide warehouses stock Tested & Structural Steel Pipe, 1/8" through 48" in all sizes and walls—"plus" Stainless, Seamless, Alloy, Pressure, Aluminum, Wrought Iron, PVC Pipe and Valves, Fittings, Flanges.

Write L. B. FOSTER CO. for latest Stock List PA-4  
Pittsburgh 30 • New York 7 • Chicago 4 • Cleveland 35  
Houston 2 • Los Angeles 5 • Atlanta 8



## Faster From Foster

PIPE • PILING • RAIL

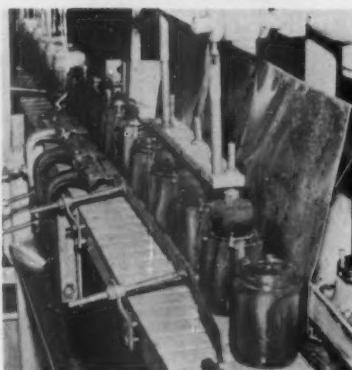
For More Information Write No. 129 on Inquiry Card—Page 34

### Hard Surfacing Increases Conveyor Life 500%



Industrial Machinery Company makes screw-type conveyors for abrasive materials. By applying a fused overlay of Colmonoy Sweat-on paste, a suspension of pure chromium bromide crystals in a suitable vehicle, the company has increased conveyor life. One customer reported that the new conveyor lasts 5 to 6 times longer than unprotected conveyors. Industrial Machinery now markets the conveyors as an entire new line abrasion-resistant line.  
Write No. 275 on Inquiry Card—Page 34

### Flat-Top Conveyor Chains Of Delrin Outlast Metal



Flat-top conveyor chains molded of Delrin acetal resin, Du Pont's new thermoplastic, are one third the weight of steel chains, outlast them two to four times, do not corrode, and require no lubrication. Initial cost is lower than that of stainless steel chain, and very little maintenance is required. The chains, sold by Fenco, Inc., are now used in bottling plants, canneries, etc.

Write No. 276 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 130 on Inquiry Card—pg. 34>

PURCHASING

An aluminum sheet and plate stretching-leveling operation at our Terre Haute, Indiana, plant. For more information about all our products and facilities, write for booklet, "This is Anaconda Aluminum".

# ANACONDA<sup>®</sup>: a respected name, and now a vigorous force in aluminum sheet

When buying aluminum for your product...

PIG • INGOT • SHEET • PLATE • TUBE  
• PIPE • ROD • BAR • EXTRUSIONS •  
PLAIN AND LAMINATED FOIL

check with...



**ANACONDA**  
**ALUMINUM**

ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE 1, KENTUCKY

NOW

# TWO FORMED TUBES PLANTS to serve you

## 1. Sturgis, Michigan

In heart of metal working industry.  
Seven large truck line terminals.  
New York Central and  
Pennsylvania Railroads.

## 2. Haleyville, Alabama

Convenient to Birmingham.  
On U. S. Highway 278.  
Southern and Illinois Central Railroads.



### STEEL TUBING

Manufactured by  
electric welding to your  
needs. Sizes  $\frac{3}{8}$ " to  
3" O.D. 20 to 10 gauge.  
Round or square.



### TEMPLATE-TRUE TUBE FORMING TO YOUR SPECIFICATIONS

Steel, copper, brass, bronze  
aluminum or stainless tubing  
fabricated to your specifications.  
Sizes  $\frac{3}{8}$ " to 6" OD, 20 to 10 gauge.  
Thirty-four years of experience in  
forming, welding, beading, bending,  
stamping of formed tubes.

Top-flight engineering service.

Write, wire or phone for booklet or quotation.  
**Formed Tubes, Inc.**  
502 Prairie Street, Sturgis, Michigan

# Formed Tubes, INC.

For More Information Write No. 131  
on Inquiry Card—Page 34

## Wax Drawing Compound Cuts Manufacturer's Costs



L. E. Borden Manufacturing Co. had been producing steel cups through a two-stage draw. When a heavy-duty, oil-type lubricant was used dies scored after only 2000 parts were produced—and these with difficulty. Using a wax-type compound made by Johnson's Wax, Borden easily draws 10,000 or more parts from commercial quality steel, 25% cheaper than the draw quality steel previously used. Downtime has been reduced and capacity of the dies has been boosted 300%.

Write No. 277 on Inquiry Card—Page 34

## Stainless Belt Outlasts Galvanized 10 to 1



Heat, cold, moisture and corrosive ingredients damaged galvanized conveyor belts so they needed yearly replacement at the plant of a major food processor. Woven wire stainless steel belts manufactured by the Cambridge Wire Cloth Co. were installed in place of galvanized. New belts show no signs of wear on corrosion and are expected to last ten

years, a major saving even though the stainless belts are four times as expensive as galvanized.

Write No. 278 on Inquiry Card—Page 34

## Two-Sided Adhesive Holds Work for Grinding

A major metal products manufacturer is using a double-faced adhesive film as a means of holding non-ferrous materials to magnetic chucks for surface grinding operations. The adhesive provides the same advantages as does magnetic chucking of ferrous materials. Set-up time is cut to the bone, and there are no clamps or walls to get in the way of the work. Adhesive is manufactured by the Interchemical Corp., Finishes Division.

Write No. 279 on Inquiry Card—Page 34

## Quick-Setting Adhesive Speeds Gun Sight Assembly



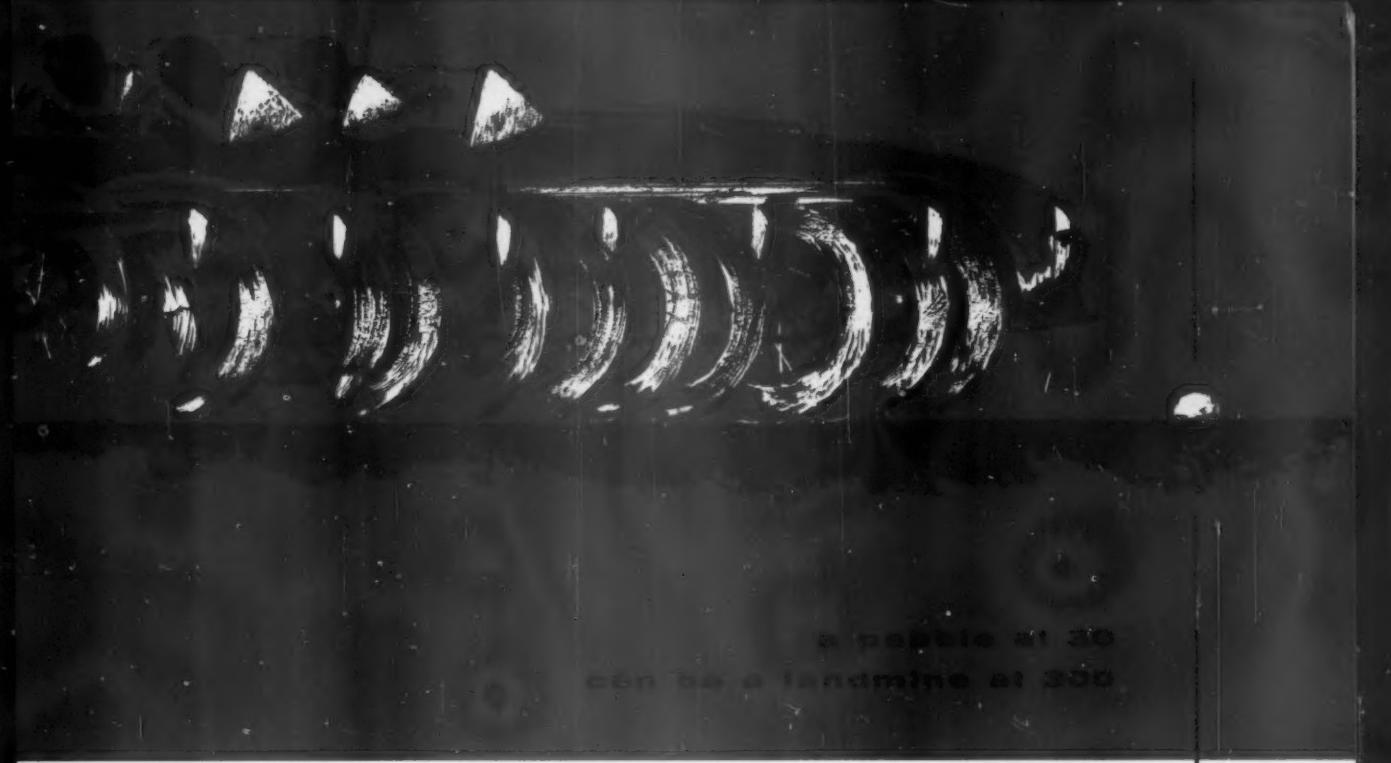
To assemble quickly and accurately an erector parallax tube for a gun sight, the Ames Rubber Co., Hamburg, N. J., turned to Eastman 910 adhesive. Two aluminum tubes are mounted, one within the other, by bonding a neoprene ring between them at one end. Initially, the ring was vulcanized in place. This required a complex jig, was inaccurate, and resulted in a high rate of rejects. The quick-setting adhesive has proved easy to use and forms a bond stronger than the neoprene.

Write No. 280 on Inquiry Card—Page 34



"...so you can see that Brand X definitely does not have the same wet strength!"

For More Information about ad on facing page Write No. 132 on Inquiry Card—pg. 34→



a pebble at 20  
can be a landmine at 300

the harder you drive for  
***super speed*** production  
the more you need safe-  
guards offered you in...



**brass**

**copper**

**aluminum**

MILL PRODUCTS

MADE IN USA

... and made better to bring out the **BEST** in your products

Scovill Manufacturing Company, Mill Products Division, 99 Mill St., Waterbury 20, Conn. Phone PLaza 4-1171

3SC60



**SCOVILL**

®

features  
to help you take  
full advantage  
of today's  
**high speed**  
methods and  
machines

**Metal soundness and uniformity** — For more than 20 years, unique Scovill *continuous casting* machines have been supplying a major part of the cast brass bars and billets used to produce strip, sheet, rod, wire and tube . . . over two billion pounds of metal that is inherently sounder and more uniform in every respect. This means fast running capability, minimum down-time and rejects, better quality products.

**Close-tolerance specifications** — Modern high-speed fabricating equipment is increasingly intolerant of what once were considered minor variations in grain size, temper, dimensions, surface finish. Scovill advanced engineering and quality-control procedures, working with new close-tolerance production equipment, meet or exceed the demands of highest-speed fabrication.

**Selection of the right alloys** — Scovill Metals Research maintains a continuing program of research into the practical needs of mill products fabricators. Scovill's broad range of alloys permits recommendation of exactly the right properties and qualities for a given job.

**The industry's most advanced packaging** — Packaging of Scovill Brass, Copper and Aluminum Mill Products can make a specific contribution to speed and efficiency in your operations . . . save you handling time and space in storage . . . cut production down-time and start-up. Scovill innovations include extra-long-run coils; Fast-Feed wire packages; easy-to-handle bundling or boxing of rod and tube.

Any fabricator who has made Scovill a part of his competitive team knows that these are only a few examples of the down-to-earth help and service he can depend upon. Call in Scovill NOW . . . especially if you want to get ideas and help in selection of the BEST metal for an important new product.



**SCOVILL MANUFACTURING COMPANY**  
Mill Products Division, 99 Mill St., Waterbury 20, Conn., Phone Plaza 4-1171



**MADE IN USA**

... and made better to bring out the **BEST** in your products

4SC60

**WELDCO**

**WELDCO**

**WELDCO**

**WELDCO**

When you  
think of  
Tubing  
Pipe and  
think of  
**WELDCO**  
**WELDCO**

**WELDCO**

**WELDCO**

**WELDCO**



THE ONLY PIPE and TUBING  
MADE WITH THE *Exclusive*  
DOUBLE-FUSION  
WELDING PROCESS

In every length of WELDCO Pipe and Tubing, you get quality, uniformity, dependability . . . because WELDCO is produced by specialists—men who have the experience, equipment and facilities to make Pipe and Tubing to your exact specifications.

WELDCO (and only WELDCO) is welded with the exclusive Double-Fusion process. It's available in Stainless Steel, Monel, Inconel, Nickel, Cupro-Nickel, Hastelloy, and Titanium, in Pipe and Tube sizes from 3" to 30", Schedules 5, 10, and 40. When you think of top-quality, dependable Pipe and Tubing, think of WELDCO. A letter or phone call puts our 30 years of specialized experience to work for you.

Whatever Your Needs in Tubing...  
You're 'Way Ahead With WELDCO



THE YOUNGSTOWN WELDING & ENGINEERING CO.  
3718 Oakwood Ave., Youngstown 9, O.

**WELDCO**

For More Information Write No. 133 on Inquiry Card—Page 34

# FIR PLYWOOD PURCHASING GUIDE

## 1. Insist on DFPA Grade-Trademarks

DFPA grade-trademarks attest quality, performance and value. They appear only on plywood manufactured, inspected and laboratory-tested under the DFPA quality control program to assure conformance to U.S. Commercial Standard quality requirements.



## 2. Choose the right grade for each job

DFPA quality-tested fir plywood comes in two types: 1. *Exterior* (waterproof glue for permanent outdoor exposure); 2. *Interior* (moisture-resistant glue) for use indoors, temporary outdoor uses and sheathing.

Within each type are *appearance grades* to meet the exact needs of any given job. Most popular grades are shown below: (other grades including panels made of other western softwoods, also available)

TYPICAL USE	EXTERIOR-TYPE (Waterproof glue)	INTERIOR-TYPE (Moisture-resistant glue)
Where appearance of both sides important. Cabinet doors, single thickness walls, etc.	EXT-DFPA-A-A	INT-DFPA-A-A
Where only one side will be seen. Siding, paneling, signs, fixtures.	EXT-DFPA-A-C	INT-DFPA-A-D
Special concrete form grades. Both faces sound, solid, smooth.	PlyForm® (B-B) (maximum re-use)	PlyForm® (B-B) (multiple re-use)
Unsanded structural and maintenance panel. Sheathing, crating, temporary screening.	EXT-DFPA-C-C	PlyScore® (C-D) (also available with Exterior glue)

**SIZES:** Standard fir plywood thicknesses are from  $\frac{1}{4}$ " through  $\frac{3}{4}$ "; standard size is 4' wide, 8' long. Other thicknesses and sizes are also available, including "king-size" scarfed panels up to 30' and 50' long.

**TEXTURED FIR PLYWOOD** — Fir plywood comes in several smart textured panels for special decorative applications such as siding, paneling, displays and fixtures. These include *Texture One-Eleven* Exterior plywood (deep parallel groove pattern, shiplapped edges) and panels with attractive *brushed*, *striated*, or *embossed* surfaces.

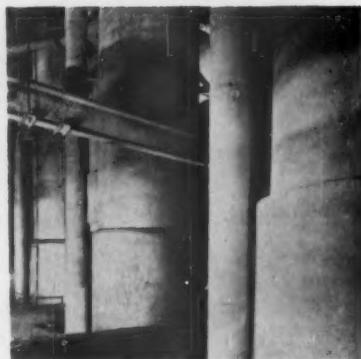
**OVERLAID FIR PLYWOOD** — is Exterior fir plywood with resin-fiber overlay permanently fused to one or both sides of panel. *High density* is hard, glossy, abrasion-resistant (use for long-lasting signs, shelving, concrete forms); *Medium density* overlaid plywood is smooth, with texture similar to drawing paper (ideal paint base for signs, fixtures, siding).



**FREE WALL HANGERS** — Handsome 18"x33" wall hanger. Handy fir plywood grade-use-specification guide. Order one for everyone in your firm who specifies fir plywood. Also available, specification portfolio. Includes detailed description all grades, sizes, specialty panels, Commercial Standards requirements. Offer good USA only. Douglas Fir Plywood Assoc., Tacoma 2, Wash., Dept. 192.

For More Information Write No. 134 on Inquiry Card—Page 34

## Stainless Tubing Saves Replacement Costs



At the Thilmany Pulp & Paper Co., Kaukauna, Wis., tubing made of type 304 stainless steel has outlasted carbon steel tubing at least 28 times to 1. Carbon tubing, used in the first effect of a black liquor evaporator, corroded through in six months. By changing to stainless, not only have many weeks downtime been saved each year, but the one-time cost of stainless tubing is much less than that of the frequent replacement of carbon steel tubing.

Write No. 281 on Inquiry Card—Page 34

## Saves Preparation Cost With New Enameling Iron



Caloric Appliance Corp., Toppen, Pa., saves processing costs because new Bethnamel enameling iron takes direct cover coating with no boiling or fish-scaling. Company uses the Bethlehem Steel product to deep draw range tops. Very low carbon content balanced with other elements provides good enameling properties, sag resistance, drawability, and weldability.

Write No. 282 on Inquiry Card—Page 34



This 36-page booklet newly published by Allegheny Ludlum is packed with technical data and authoritative information on both welded and seamless stainless steel tubing. There are more than 20 tables for ready reference and many photographs.

It will be helpful to design engineers and others interested in solving the many critical and demanding pipe and tubing applications.

1287

The booklet contains the best and latest information available on product and design data on the subject—the partial contents listed give some idea of its scope. You'll want a copy for your files.

Write for your free copy of Allegheny Stainless Steel Tubing, *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. P-5-2.*

## ALLEGHENY LUDLUM

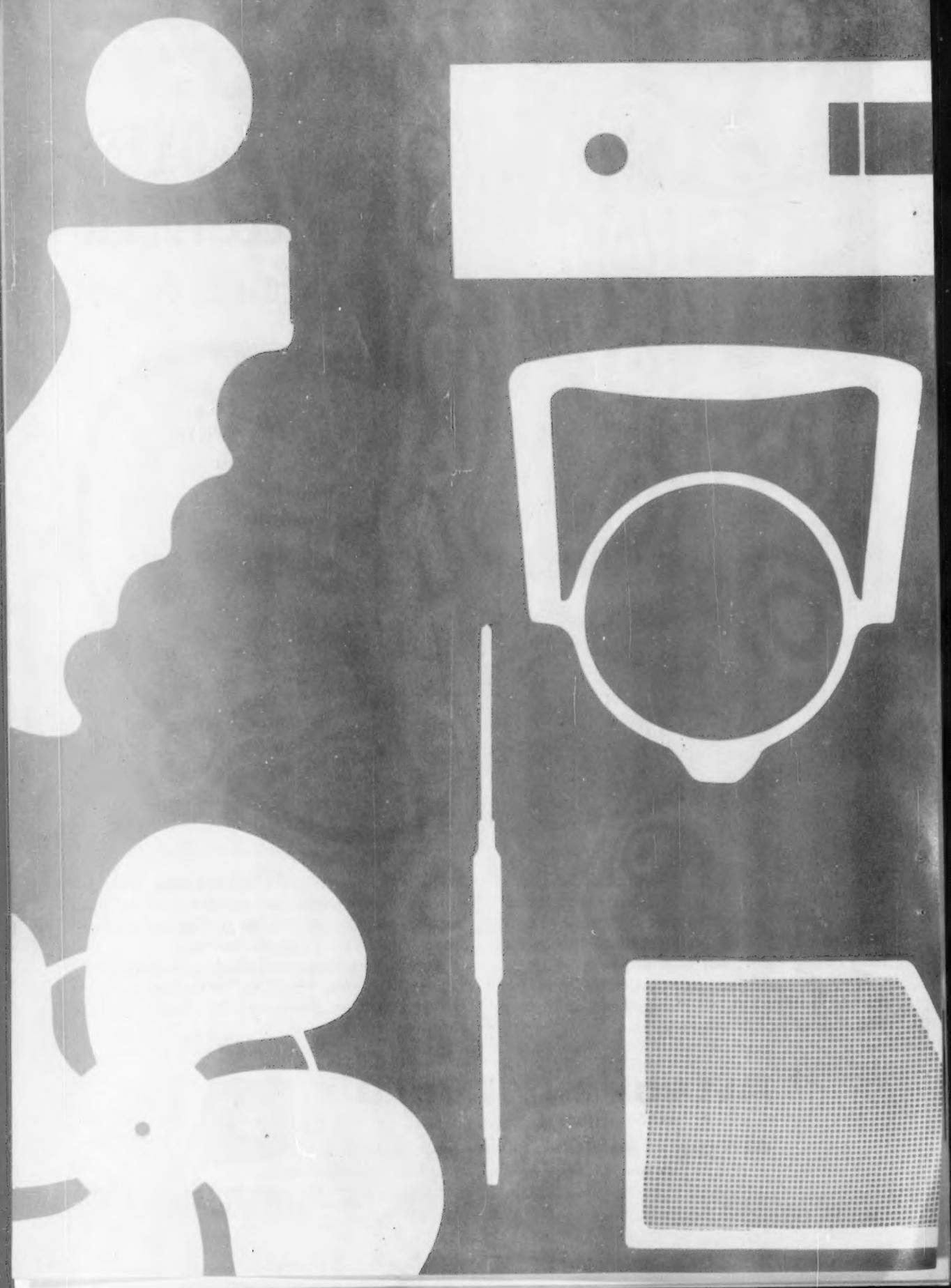
Export distribution: AIRCO INTERNATIONAL

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

For More Information Write No. 135 on Inquiry Card—Page 34

For More Information about ad on following page Write No. 136 on Inquiry Card—pg. 34→

215



# What 3 things do these parts have in common?

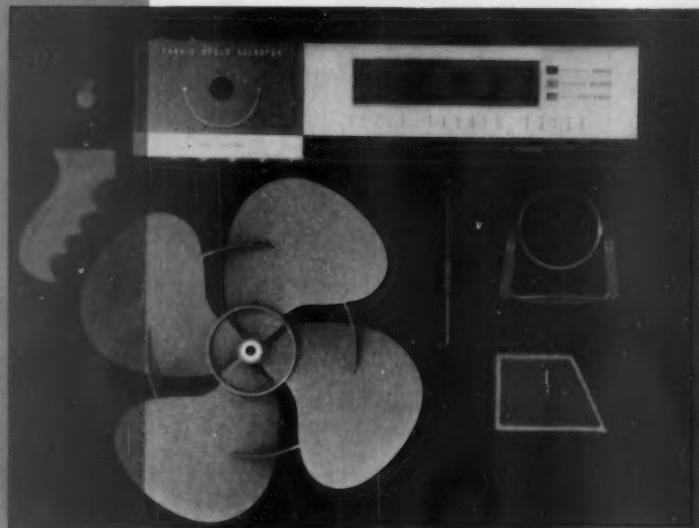
They perform better. Yet they cost less. And they are all molded of plastics.

The exhaust fan blades have a molded-in metal bearing, and are unaffected by corrosive fumes. The washing machine filter not only costs less to make, it also licked a rust problem. The one-piece phonograph spindle cap simplified a complicated assembly, while maintaining tolerances of +.003 and -.000.

The jewelers' screw driver, the pistol grip tool handle, the dryer control panel, and the milk bottle handle are all low cost product improvements, made possible by the ever-widening choice of plastics materials and the growing efficiencies of custom molders.

Think of the custom molder of plastics as the "manufacturer's manufacturer." His engineering staff measures the product for plastics. His tool-makers build the master molds to close tolerances. His manufacturing facilities produce the most complex parts with consistent quality, at rates to meet the tightest schedules and budgets.

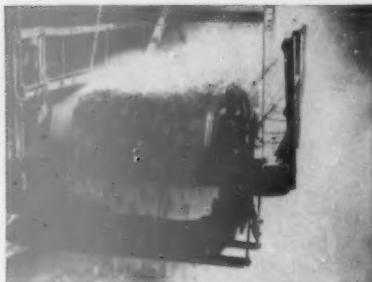
Monsanto, supplier of plastics molding compounds to leading custom molders, has prepared a special report on "How To Buy Custom Molded Plastics." Write for your free copy to Monsanto Chemical Company, Plastics Division, Room 710, Springfield 2, Mass.



## MONSANTO PACE-SETTER IN PLASTICS

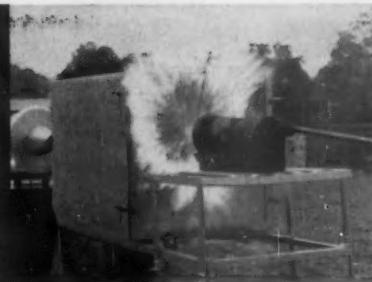


# WHEN YOU NEED RESILIENCE PLUS ...



## RESISTANCE TO HEAT

A million tons of hot coke have not harmed this neoprene belt.



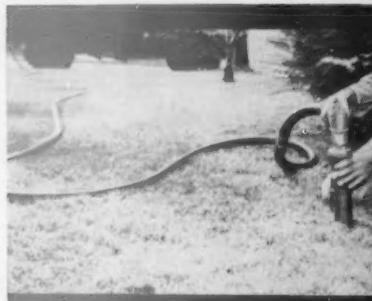
## RESISTANCE TO FLAME

Neoprene coated firewalls for aircraft pass this flame thrower test.



## RESISTANCE TO COLD

Neoprene remains flexible even at -65° F.



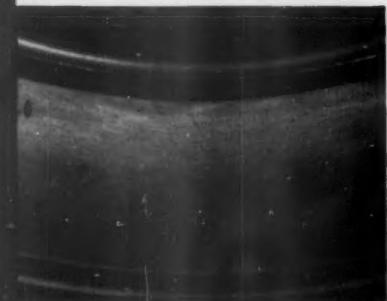
## RESISTANCE TO OIL

Neoprene retains its properties in contact with oil and grease.



## RESISTANCE TO WEATHER

After 25 years' exposure, neoprene cable (bottom) shows no surface cracking.



## RESISTANCE TO OZONE

Neoprene tire sidewalls resist ozone cracking.



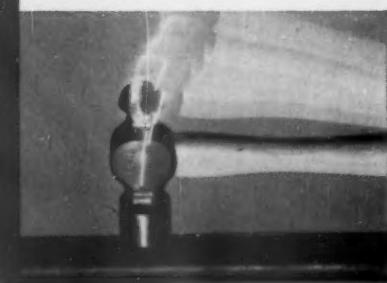
## RESISTANCE TO ABRASION

Tough neoprene gives dependable service in severe applications.



## RESISTANCE TO CHEMICALS

Neoprene assures protection against most acids and chemicals.



## RESISTANCE TO IMPACT

Neoprene has outstanding resilience, resists permanent distortion.

## SPECIFY VERSATILE DU PONT NEOPRENE synthetic rubber

A quarter century of industrial service has proven that versatile Du Pont neoprene, with this balanced combination of properties, can meet a range of severe service requirements. Neoprene products are

available from rubber goods manufacturers and distributors. For additional information, write E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Department P-5, Wilmington 98, Delaware.



BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

NEOPRENE MAKES TODAY'S PRODUCTS BETTER . . . TOMORROW'S PRODUCTS POSSIBLE

For More Information Write No. 137 on Inquiry Card—Page 34

Salt River Valley Water Users Association,  
Phoenix, Arizona

# Saves \$699.00 per pump...

by using ground and polished



The men who operate the "Salt River" project have the job of supplying water to 240,000 acres of land in Arizona, where the Gila River joins the Salt River. The Association maintains some 250 deep well pumps to help supply the required water.

Richard Juetten, Supervisor of Salt River's Pump Division, reports that the use of La Salle FATIGUE-PROOF steel bars has permitted a saving of \$699.00 per pump . . . a potential saving of \$174,750 when applied to the 250 pumps now in operation.

Mr. Juetten's report follows:

"I have figured our direct saving realized by using La Salle FATIGUE-PROOF steel bars in place of standard C-1045 steel shaft in our deep well turbine pumps.

"FATIGUE-PROOF enables us to use bars only  $1\frac{11}{16}$ " in diameter . . . instead of  $2\frac{3}{16}$ " diameter shafts which were necessary when we used C-1045 . . . and this despite higher horsepower, more weight, and additional pump bowl assemblies.

"Here are comparative costs per 10-foot section (of a 300-foot pump shaft):"

using C-1045	using FATIGUE-PROOF
10" x 2-3/16" dia. shaft.....	\$28.30
3 1/2" shaft housing.....	26.30
2 bearings, 3 1/2" x 2-3/16".....	21.72
Shaft coupling.....	5.16
<b>TOTAL cost.....</b>	<b>\$81.48</b>
Cost per foot.....	\$ 8.15
10" x 1-11/16" dia. FATIGUE-PROOF.....	\$22.59
3" shaft housing.....	19.80
2 bearings, 3" x 1-11/16".....	13.46
Shaft coupling.....	2.34
<b>TOTAL cost.....</b>	<b>\$58.19</b>
Cost per foot reduced to.....	\$ 5.82

RESULT: A saving of \$2.33 per foot . . . or \$699.00 when applied to a 300-foot pump setting. And this doesn't take into consideration reduced power consumption.



**La Salle** STEEL CO.

1432 150th Street  
Hammond, Indiana

ASK FOR 24-PAGE BOOKLET—It tells the complete story of FATIGUE-PROOF®

name \_\_\_\_\_

title \_\_\_\_\_

company \_\_\_\_\_

address \_\_\_\_\_

city and zone. \_\_\_\_\_ state. \_\_\_\_\_

Mail to La Salle Steel Company, 1432 150th Street, Hammond, Indiana

For More Information Write No. 138 on Inquiry Card—Page 34

# the sky's the limit!

Into orbit goes a product of years of exhaustive research.

When the count down occurs, the critical product must meet the demands.

For years Wall Tube's depth of experience has met the demands of even the most exacting tests. Seamless and welded stainless steel tubing of the highest quality is the Wall Tube standard.

Our representatives are anxious to demonstrate the reliable Wall tubing line. Investigate this vital new source today!

## RANGE OF MANUFACTURE

**Stainless Steel - Welded and Cold Drawn - 11"**  
OD to 3 32" OD  
.083 to .088 walls.  
**Seamless - 5/8" OD**  
to 3 32" OD  
.049" to .008" walls. Nickel and nickel alloy - seamless.  
OD to 3 32" OD  
.049" to .008" walls.

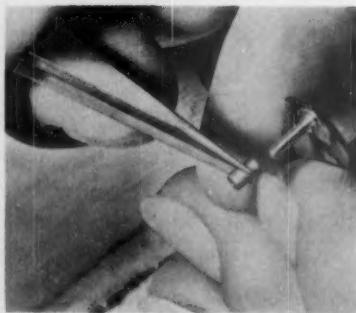
**WALL TUBE AND METAL PRODUCTS CO.**

NEWPORT, TENNESSEE

For More Information Write No. 139  
on Inquiry Card—Page 34

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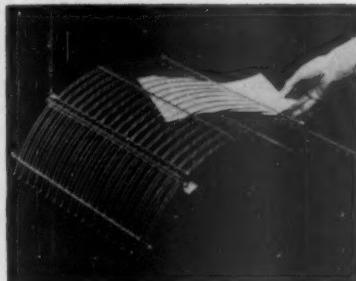
## Screw Spacer Saves \$6.05/M pieces



By using hypodermic needle tubing instead of drilled bar stock for screw spacers in eyeglass hearing aids, Maico Electronics Inc., Minneapolis, Minn., has saved \$6.05 per thousand pieces. The 14 gauge needle tubing, made of type 304 stainless steel, is supplied by the Superior Tube Co. Uniform dimensions assure fast assembly.

Write No. 285 on Inquiry Card—Page 34

## No Static Electricity With Wire Paper Guide



The effect of static electricity on paper forms was a problem in data processing machines manufactured by IBM. Static charge was collected as paper passed through sheet metal paper guides. E. H. Titchener & Co. redesigned the guides in stainless steel wire. Reduced contact area and greater smoothness of wire has eliminated static electricity and is easier to clean as well.

Write No. 284 on Inquiry Card—Page 34

## Special Wire Ends Welding Problems

A maker of drive shafts had a problem in welding medium carbon steel and sulfur-bearing steel. Looking for better quality and lower cost through an inert gas

process, the company chose Page A-S-18 welding wire for the job. A-S-18 eliminated cracks which had been a problem in production. In addition, it was no longer necessary to preheat the parts, thus saving time and equipment. Use of CO<sub>2</sub> as a shielding gas also eliminated a costly flux recovery system.

Write No. 285 on Inquiry Card—Page 34

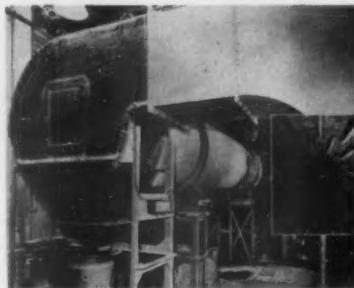
## Steel Rifle Barrels Save Time and Materials



Use of type MT 1015 carbon steel tubing instead of bronze tubing for barrels of BB rifles and revolvers brought savings not only in material but also in machining cost, reports the Crosman Arms Co., Inc., Fairport, N.Y. Barrels are cut off on screw machine, drilled for retaining screw or pin, then rifled. The tubing is cold drawn by the Superior Tube Co. to close bore tolerances.

Write No. 286 on Inquiry Card—Page 34

## Polyester Resin Ends Corrosion Problem



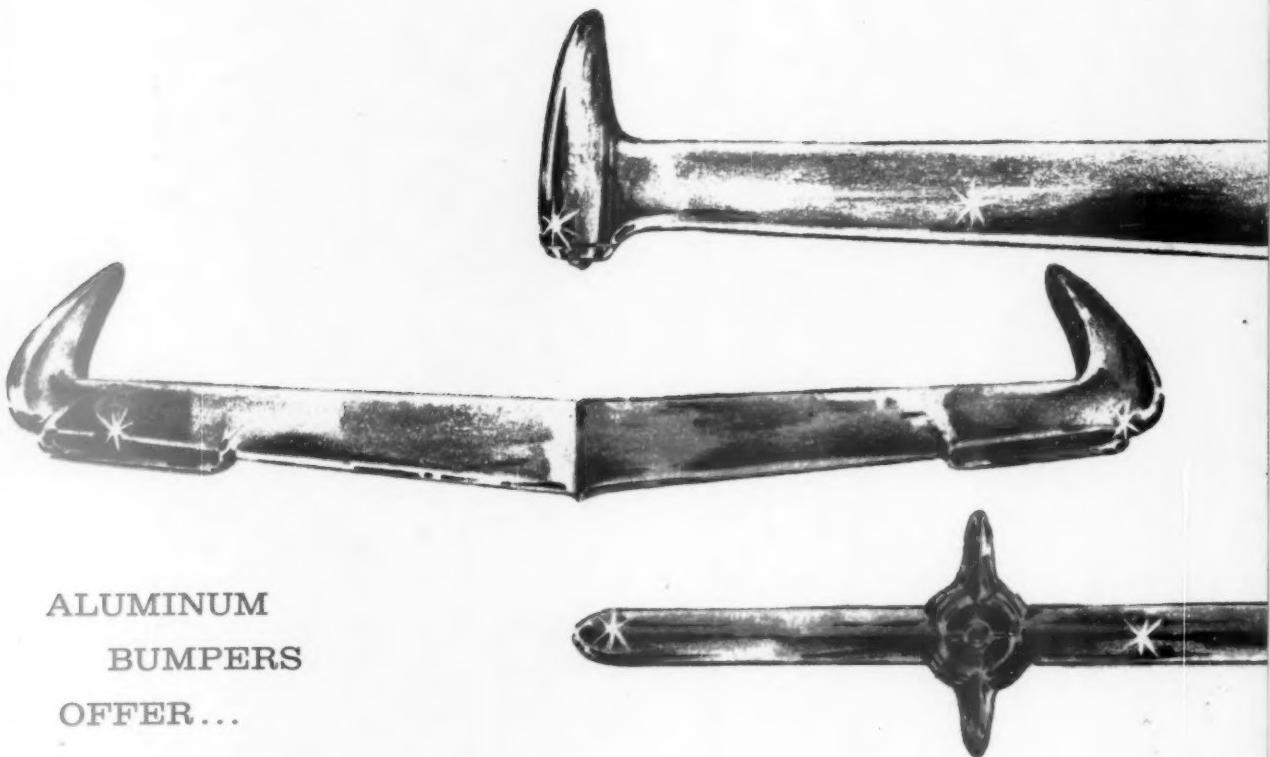
An eastern chemical plant had trouble with corrosion during processing of inorganic materials wet with hydrochloric acid at high temperature in a rotary dryer.

(Please turn to page 225)

For More Information about ad on facing page  
Write No. 287 on Inquiry Card—Page 34  
PURCHASING

How Aluminum Bumpers  
reduce costs,  
cut weight,  
permit design  
versatility





## ALUMINUM BUMPERS OFFER...

**Fabricating Savings.** Depending on size and design, formed extruded aluminum bumpers can be fabricated with a per bumper saving of \$1.25 to \$3.00. An average saving of \$3.00 to \$4.00 per car is very realistic. Reynolds work with forming techniques has demonstrated that complex shapes can be formed without sacrifice of mechanical properties and without impairing brightness of the rust free anodized surface.

**Important Weight Savings.** Current bumpers average out at 36 to 40 pounds. Comparable designs in aluminum weigh 15 to 22 pounds. Average weight savings per car with aluminum bumpers are estimated at around 40 pounds. Aluminum bumpers can cut "overhang" weight, give brakes less load to stop—aid in the overall automobile design programs to reduce deadweight and improve car performance.

**Styling and Design Versatility.** Deep recesses or grooves can be easily designed into aluminum bumper extrusions to achieve styling effects that cannot be accomplished with other metals. Also, aluminum extrusions can be anodized to full thickness even though grooves and recesses and sharp corners are specified. This cannot be done with plating processes on other metals. For

this reason, it is safer to design with aluminum from the standpoint of customer satisfaction and warranty costs. Contrasting colors can also be added through the use of organic finishes—paint films adhere to anodized aluminum much better than to other bright trim materials.

**Strength.** Average material in the conventional bumper has a yield strength of between 25,000 and 30,000 pounds per square inch. Aluminum alloys used by Reynolds in sample bumper fabrication have a yield strength of 31,000 pounds per square inch. Reinforcing members integral with the extrusion can be easily designed into the bumper for even greater strength.

For information and assistance on aluminum automotive applications, talk to a Reynolds Aluminum Specialist. Write or phone *Reynolds Metals Company, P.O. Box 5050, Seven Oaks Station, Detroit 35, Kenwood 7-5000*. Or contact your nearest Reynolds office or write P.O. Box 2346-MW, Richmond 18, Virginia.

**NOTE:** Before you buy any part—have it designed and priced in aluminum. Basic material costs do not determine part costs. New techniques and processes—applicable only to aluminum—can give you a better product at a lower final cost.



## REYNOLDS ALUMINUM

the metal for *automation*

TRADE MARK

Watch Reynolds TV shows—"ADVENTURES IN PARADISE", "BOURBON STREET BEAT" and "ALL STAR GOLF"—ABC-TV.

# A small fable with a large moral



*Farmer owned a sleek Jersey cow.  
He milked the cow every day,  
and his children drank every drop.*

*One day a neighbor said to him:*



*"Charlie, my cows give more milk than I need.  
I'll sell you a bucket a day very cheaply,  
and you won't have to bother with milking any more."*

*The Farmer had a nose for bargains.  
He accepted the deal. Instead of milking twice a day,  
he had more time to watch TV.  
Then one day his neighbor's wife had triplets.  
They no longer had any milk to spare.  
The Farmer tried to milk old, faithful Bossy,  
but—alas—she had dried up.*

**MORAL:** If you don't milk the cow you have, some day you may be awfully thirsty.

Whether you're a farmer or steel buyer, your safest, most reliable suppliers are right here at home. No one knows the needs of American steel buyers better than American steel makers. To serve you, and serve you well, is our primary concern—not just today and tomorrow—but year after year.

For quality steel of certified analysis, meeting the appropriate specifications, you can rely on Bethlehem

Steel for such products as reinforcing bars, wire and wire products, pipe, structural shapes, plates, carbon bars . . . hot-rolled, cold-rolled, and galvanized sheets . . . transmission towers and other fabricated steel, wire rope, and industrial fasteners.

And remember, our engineers are on call to help you solve your steel-working problems.

## BETHLEHEM STEEL

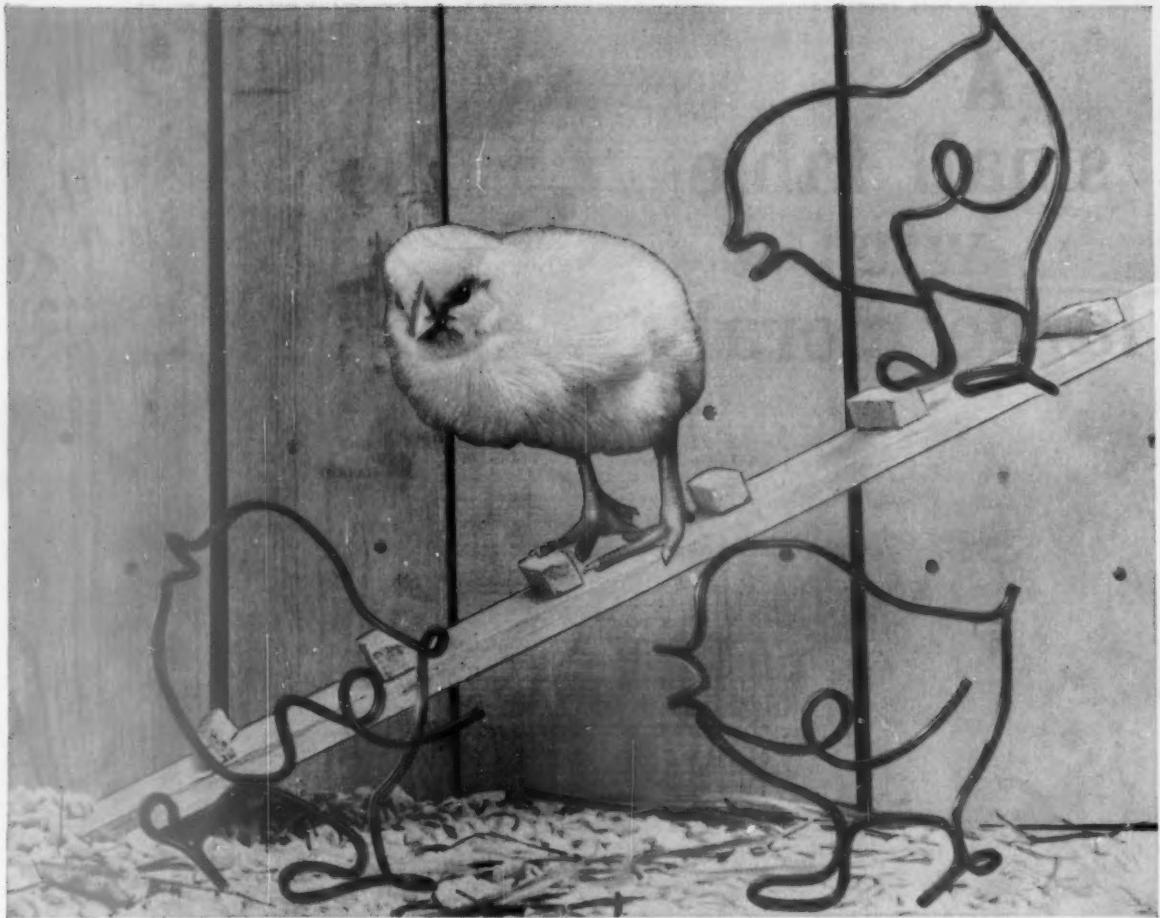
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.



for Strength  
... Economy  
... Versatility



For More Information Write No. 288 on Inquiry Card—Page 34



## Bundy can mass-fabricate practically anything

You get faster service, lower costs—  
when you choose **Bundyweld® double-walled steel tubing**

The old adage, "Don't count your chickens before they hatch," is a good one . . . but it never applies to Bundy when it comes to "delivering the goods" in a hurry! Whether you order Bundyweld—the original double-walled steel tubing—from stock, or mass-fabricated to your specifications, you can count on Bundy to be there on time.

And Bundy provides designing and engineering services—working hand in hand with your own engineers—to save time and solve problems. This, combined with Bundy's special machinery for the mass-fabrication of small-diameter tubing, means you get tubing that meets your exact specifications. Covered by Government Spec. MIL-T-3520, Type III.

So, when you want to talk tubing, talk to the leader—Bundy! Phone, write, or wire Bundy Tubing Company, Detroit 14, Michigan.

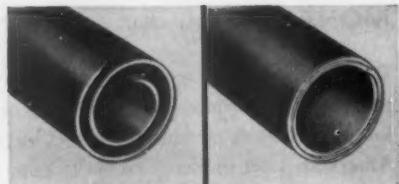
*There's no substitute for the original Bundyweld Tubing.*

# BUNDY TUBING COMPANY

HOMETOWN, PA. • DETROIT 14, MICH. • WINCHESTER, KY.

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING. AFFILIATED PLANTS IN AUSTRALIA, BRAZIL, ENGLAND, FRANCE, GERMANY, AND ITALY

For More Information Write No. 289 on Inquiry Card—Page 34



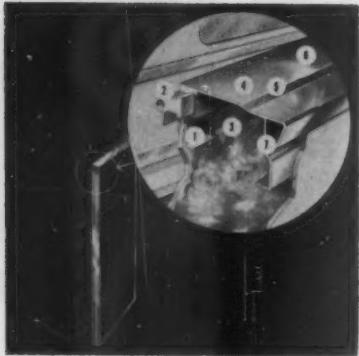
Bundyweld is the original tubing double-walled from a single copper-plated steel strip, metallurgically bonded through 360° of wall contact for amazing strength, versatility.

Bundyweld is lightweight, uniformly smooth, easily fabricated. It's remarkably resistant to vibration fatigue; has unusually high bursting strength. Sizes up to  $\frac{3}{8}$ " O.D.

(Continued from page 220)

The acid vapor passed through the exit housing and caused severe damage to equipment, and product contamination. A new dryer, fabricated with Hooker fiberglass-reinforced polyester resin was used in place of the original metal alloy unit. After six months, the dryer shows no sign of corrosion and products are uncontaminated. Write No. 290 on Inquiry Card—Page 34

### Single Shape Performs Seven Functions



A single aluminum extrusion, used as a refrigerator door frame, enabled the Philco Corp., Philadelphia, to combine seven functions in one shape. Use of extrusion reduced the number of parts, tooling costs, assembly time, and extra labor and handling. Material was designed and produced by the Bohn Aluminum & Brass Corp.

Write No. 291 on Inquiry Card—Page 34

### Inert Gas Welding Improves Furnace Life



Hastelloy Alloy X, welded by Linde's Heliarc inert gas process, has increased the operating life

(Please turn to page 228)

MAY 23, 1960

Metal That Costs Less Here —

RECEIVING

SHIPPING

YOUR PLANT

May Be Costing YOU  
MORE here!

## 2 WAYS TO REDUCE METALWORKING COSTS

Longer Tool Life • Fewer Rejects • Better Performance



## PHOSPHOR BRONZE

## NICKEL SILVER

These metals may cost more initially than your present material, but they can cost you a lot less in your finished product. Reason: They cost less to form, fabricate and machine. They are easier on your tools and result in fewer rejects. There's a ready market for production scrap. What's more, these metals have intrinsic physical properties such as corrosion resistance and high fatigue life which can improve your product quality.

This may be a new cost-cutting idea for you. We'll be glad to help you look into it.

**WATERBURY ROLLING MILLS, INC.**

Main Offices and Plant: Waterbury, Connecticut • Tel. Plaza 4-0151

- In N. Y. C.—Murray Hill 7-1246
- In Phila.—ADams 3-1869
- In Chicago—Sheidrake 3-0100
- In Detroit—DUmkirk 6-3444
- In Cleveland—YELLOWSTONE 2-6455
- In Boston—CUNNINGHAM 6-7575

WB-60

For More Information Write No. 292 on Inquiry Card—Page 34

For More Information about ad on facing page Write No. 293 on Inquiry Card—pg. 34→

225



*stainless from creative Crucible*

## Where a fine finish is a work

The lustrous elegance of Crucible stainless reflects the steelmakers' art. Inherent in each strip, sheet, bar and wire are qualities of unusual uniformity — made possible only through the steelmakers' exacting care. To combine this artistry with the excellence of your product, call or write any of the 34 local Crucible service centers.

**CRUCIBLE**

Stainless Steel

of art





Rope Wire      Hose Wire  
 Fuse Wire      Lamp Wire  
 Pin Ticket      Match Wire  
 Bonnet Wire      Steel Heddle  
 Spiral Binding Wire • Box Stay Wire  
 Bookbinders Wire • Stapling Wire  
 Tin Shaft Wire • Glass Netting Wire  
 Tinned Covering Wire • Hair Pin Wire  
 Tinned Anneal Tag Wire • Weaving Wire  
 Filler Wire • Ring Traveler • Mandrel  
 Wire • Tea Bag Wire • Stitching Wire  
 Liquor Stapling Wire—Brush.

## *Specialty Wire... our cup of tea*

**Problem:** Staple the tea bag to the string and the string to the trademark tab. Make the attachment tear-proof and keep stapling machines running smoothly. Meet strict Government regulations involving cleanliness of wire, metallic content and corrosion factors.

**Answer:** Call Prentiss. This major tea firm did. Now, "being in hot water" is no problem at all. Write, call or wire: Prentiss Works, Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Holyoke, Mass.

**RIVERSIDE-ALLOY METAL DIVISION**



**H. K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

For More Information Write No. 294  
on Inquiry Card—Page 34

(Continued from page 225)

of furnace retorts by 83.3%, while reducing maintenance by 75%. The retorts, built by Alloy Engineering Co. for Convair, are operating without warping after 200, four-hour brazing cycles at 1700 F. After only 24 cycles, the previously used alloy retorts, joined by covered-electrode welding, warped and fell apart at the joints. Write No. 429 on Inquiry Card—Page 34

### **Short Arc Welding Cuts Labor Costs**



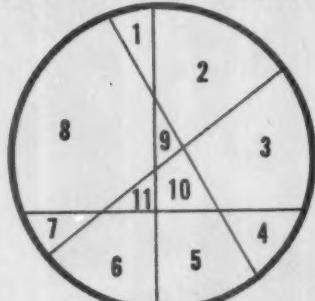
At Wroble and Gauer, Kenilworth, N. J., assembly of steel-tube frames with covered electrode welding produced spatter and slag, which had to be removed before chrome plating. Post-weld grinding and chipping ran up labor costs. Clean-up work has now been eliminated by using Sigma short arc welding which reduces spatter and prevents slag formation. Write No. 430 on Inquiry Card—Page 34

### **Vinyl Liners Solve Alum Storage Problem**



Leakage of corrosive liquid alum was a storage problem solved recently at the Bound (Please turn to page 232)

Solution to problem on page 39



The obvious answer is eight segments. However, you can actually make 11. In the selection and application of steel, aluminum, plastics and metalworking machinery, don't settle for the obvious. Be "Metalogical"—call Ryerson Steel.

For More Information Write No. 295  
on Inquiry Card—Page 34

**For a Complete  
Report on  
the 45th Annual  
N.A.P.A. Convention**

**DON'T MISS  
THE JUNE 20th  
Issue of  
PURCHASING Magazine**



## THIS MAN KNOWS THE DIFFERENCE

### It's piston rings of TEFLO<sup>®</sup> and \$3,750 in savings per year per machine

The man in the purchasing department sometimes has a hard time evaluating first cost, performance and over-all cost. At other times, fortunately, the decision is clear-cut. In the heavy-duty compressor shown above, for example, piston and wear rings lasted less than a week on the average. Then a set of rings made of a filled TEFLO<sup>®</sup> TFE resin was substituted. First cost of rings made of TEFLO<sup>®</sup>: 40% of the cost of previous rings. Performance: the rings made of TFE resins are still in operation after three and one-half years of service. Savings: according to the manufacturer, maintenance savings in labor alone amount to approximately \$3,750/year/machine.

Such economies in maintenance and replacement costs emerge in all types of floating ring applications of TEFLO<sup>®</sup>.

resins. These resins are tough, completely inert to virtually all chemicals and resistant to temperature extremes. Their very low coefficient of friction eliminates problems of slip-stick and often permits the use of non-lubricated rings. The use of TEFLO<sup>®</sup> resins permits full standardization, reducing inventory problems.

If lower costs, longer life, fewer maintenance problems, extra reliability make a difference in your operations, it will pay you to find out more about the engineering properties of TEFLO<sup>®</sup> resins in sealing applications. For more information, write to: E. I. du Pont de Nemours & Co. (Inc.), Polymers Dept. T-50523, Room 2526, Nemours Building, Wilmington 98, Del.

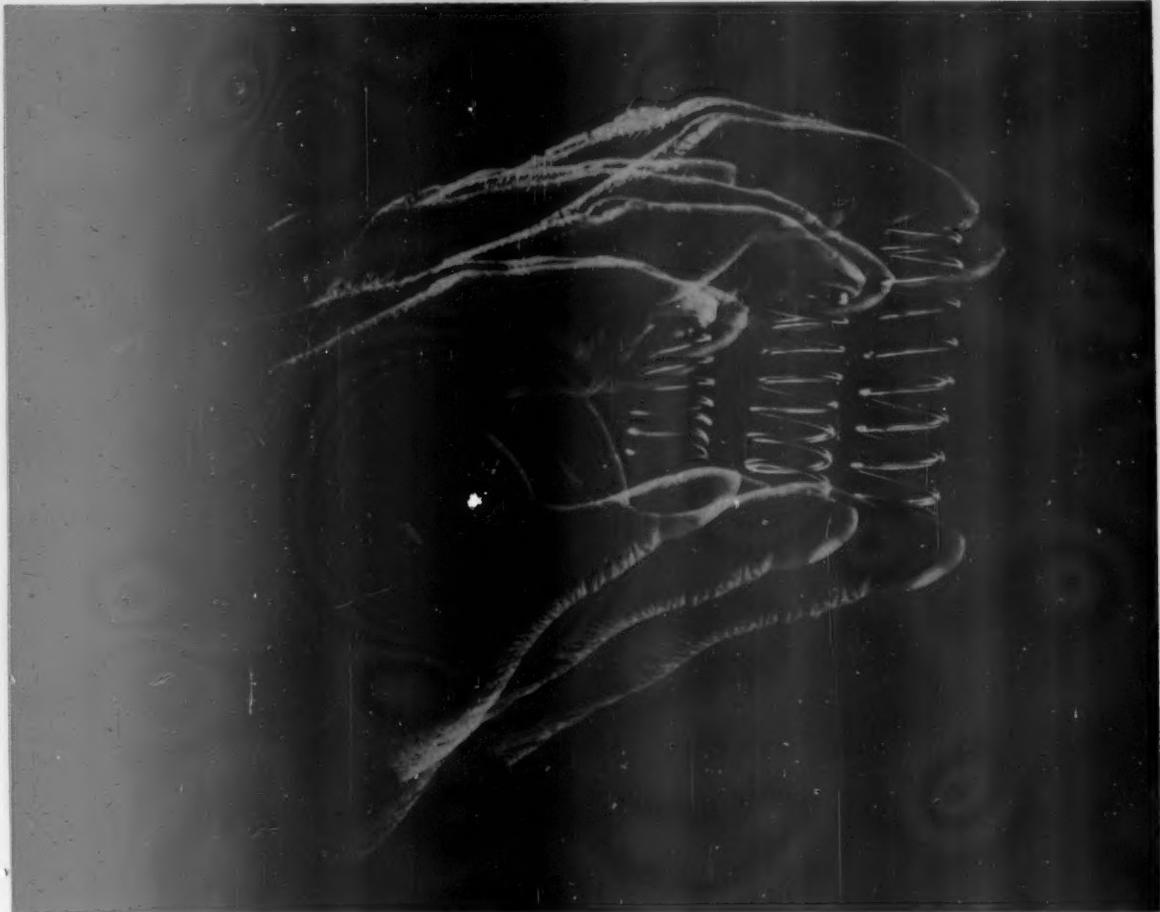
In Canada: Du Pont of Canada Limited, P. O. Box 660, Montreal, Quebec.



TEFLON is Du Pont's registered trademark for its family of fluorocarbon resins, including TFE (tetrafluoroethylene) resins and FEP (fluorinated ethylene propylene) resin.

For More Information Write No. 296 on Inquiry Card—Page 34

**UNIFORM TEMPER** **UNIFORM DIMENSION**  
**UNIFORM GRAIN SIZE** **UNIFORM**  
**TENSILE STRENGTH** **UNIFORM COATING**



**The most uniform springs just naturally start with . . .**  
**RIVERSIDE-ALLOY SPRING MATERIALS**

It's an acknowledged fact in the trade that Riverside-Alloy produces the finest spring materials for corrosion-resistant and high temperature applications . . . materials more uniform in *all* the properties that make good springs.

But what about the specific alloy and shape you need? Riverside-Alloy is a *single, dependable source* for spring

material in Stainless steel (Isoloy), Phosphor bronze, Nickel silver, Monel, Inconel, Inconel "X" and Durnickel . . . in wire, flat wire and strip.

Write today for a copy of the new "Spring Materials Digest" and other specific information. We have the people who can talk *springs*. *Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, N. J.*

**RIVERSIDE-ALLOY METAL DIVISION**

**PORTER**

**H. K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and piping fittings, roll formings and stampings, wire rope and strand.

For More Information Write No. 297 on Inquiry Card—Page 34

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For More Information about ad on facing page Write No. 298 on Inquiry Card—pg. 34  
PURCHASING



where moisture  
and abrasion

meet brightness

that never wears out

sink frames of

# Superior

STAINLESS STRIP STEEL

At the toughest spot in the kitchen, Superior Stainless shows its metal best . . . the ever-bright, smooth gleam that asks no more than a wipe to reflect a housewife's pride. • Solid Superior stainless sink frames fabricate uniformly well because composition, dimensions and temper are uniformly as specified, every time. • We can serve you exactly as you wish. Ask us!



**SUPERIOR STEEL DIVISION**

OF  
**COPPERWELD STEEL COMPANY**  
**CARNEGIE, PENNSYLVANIA**

For Export: Copperweld Steel International Company, New York

(Continued from page 228)  
 Brook, N. J. station of Elizabeth-Brown Water Co. Consolidated. Two 8,000 gallon storage tanks were lined with .020 inch thick vinyl sheeting, ending leakage of the alum and reducing handling costs. The liners were made on order by Bakelite Company to insure perfect fit. Installation time was less than two hours.

Write No. 431 on Inquiry Card—Page 34

### Work Held By Tape Triples Production



Double-sided, pressure sensitive tape solved a work holding problem in grinding brass feed disks at The Heald Machine Co., Worcester, Mass. Because the brass parts could not be held on a magnetic chuck, they had to be held in place with steel strips. This complexity held production to about 25 parts an hour. A switch to tape increased production 300% and also reduced scrap significantly.

Write No. 432 on Inquiry Card—Page 34

### Radar Traffic Regulators Protected By Polyester



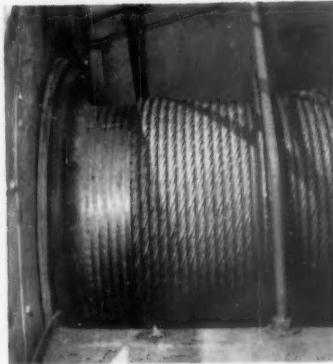
Radar traffic detectors made by the Automatic Signal Division, Eastern Industries, are protected from the elements by polyester fiberglass housings as supplied by National Vulcanized Fibre Co.

(Please turn to page 238)

In two years of field service, the housings are reported to show no tendency to weather damage. The units are used in every climate in the United States. Installed over roadways, the radar devices pick up impulses from vehicles and regulate signals.

Write No. 433 on Inquiry Card—Page 34

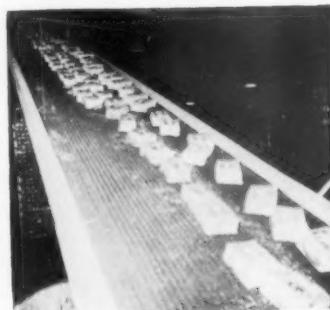
### New Type Wire Rope Outlasts Others 3 to 1



Replacement costs of wire rope have been cut by two-thirds at Gray & Fear Contractors, Woodbury, N.Y. After a year's use, the contractors say a herringbone type wire rope from John A. Roebling outlasts previously used ropes three to one. The rope is used on back-hoes, for clam shell and dragline work.

Write No. 434 on Inquiry Card—Page 34

### Conveyor Belt Boosts Efficiency 100%



A large baking company was having difficulty conveying baked goods down a 29% decline belt. The packages would slide helter-skelter down two-thirds of the length of conventional package belts. A new package conveyor developed by Goodyear, called Wedge-Grip, was installed and efficiency of the operation was increased.

(Please turn to page 238)

# ASARCO

### DISTRIBUTORS for ASARCON CONTINUOUS-CAST BRONZE

#### MISSOURI

Kansas City

Associated Bearings Co.

VALENTINE 1-3393

Hubbell Metals, Inc.

BALTIMORE 1-7760

St. Louis

Hubbell Metals, Inc.

FRANKLIN 1-0212

NEBRASKA

Grand Island

The Island Supply Co.

DUPONT 2-8567

Omaha

T. S. McShane Co., Inc.

JACKSON 1-2723

NEW JERSEY

Carlstadt

E. A. Williams & Son

GENEVA 2-0800

MARKE 31929

(New York LA 4-9546)

Newark

Federal Foundry Sales, Inc.

MARKE 2-6330

Perth Amboy

Grayson Brass Foundry

HILLCREST 2-2086

NEW YORK

Brooklyn

Hansley, Inc.

STERLING 8-1144

Buffalo

Kencraft Associates, Inc.

RIVERSIDE 1520

RIVERSIDE 2020

Rochester

Ontario Metal Supply, Inc.

HAMILTON 6-1630

Syracuse

Melton Bronze Foundry, Inc.

GLENVIEW 4-3231

Troy

The Troy Belting & Supply Co., Inc.

AS 2-4920 (in Albany 3-6121)

OHIO

Akron

Johns Welding and Spring Co.

JEFFERSON 2-2187

Cleveland

Copper & Brass Sales, Inc.

ENDICOTT 1-6757

The Bearing Bronze Casting Co.

MICHIGAN 1-6526

Cincinnati

Wright Castings Corp.

KIRBY 1-2327

Columbus

Williams & Co., Inc.

ADMINISTER 4-1623

Dayton

The Bristol Brass Corp. in Ohio

FULTON 8185

Toledo

The Seeger Brass Company

CHILLICOTHE 5-5224

Williams & Co., Inc.

GREENWOOD 5-8661

PENNSYLVANIA

Easton

R. T. Schaller Co.

EASTON 2-2435

Latrobe

Latrobe Foundry Machine

5 & 6 CO.

KEYSTONE 7-3341

Philadelphia

Brass & Copper Sales, Inc.

GLADSTONE 7-2500

Renewal Service, Inc.

BALDWIN 6-6330

Pittsburgh

Pennsylvania Industrial

Supplies Co., Inc.

ALLEGHENTY 1-5010

Pittsburgh Brass Mfg. Co.

ATLANTIC 1-8761

RHODE ISLAND

Providence

Citron Metal Sales Co., Inc.

UNION 2-1000

SOUTH CAROLINA

Greenville

J. M. Tull Metal & Supply Co., Inc.

CEDAR 3-3366

TENNESSEE

Memphis

Memphis Bearing & Supply Co.

JACKSON 6-7543

Nashville

Dixie Bearings, Inc.

CHAPEL 2-7351

TEXAS

Beaumont

Standard Brass & Mfg. Co.

TERMINAL 3-2641

Houston

Standard Brass & Mfg. Co.

CAPITOL 5-6531

Port Arthur

Standard Brass & Mfg. Co.

YUKON 5-9377

WISCONSIN

Milwaukee

Badger Bearing Co.

BROOKFIELD 2-0231

CANADA

Lachine, Quebec

Federated Metals Canada, Ltd.

MELROSE 7-3591

Scarborough, Ontario

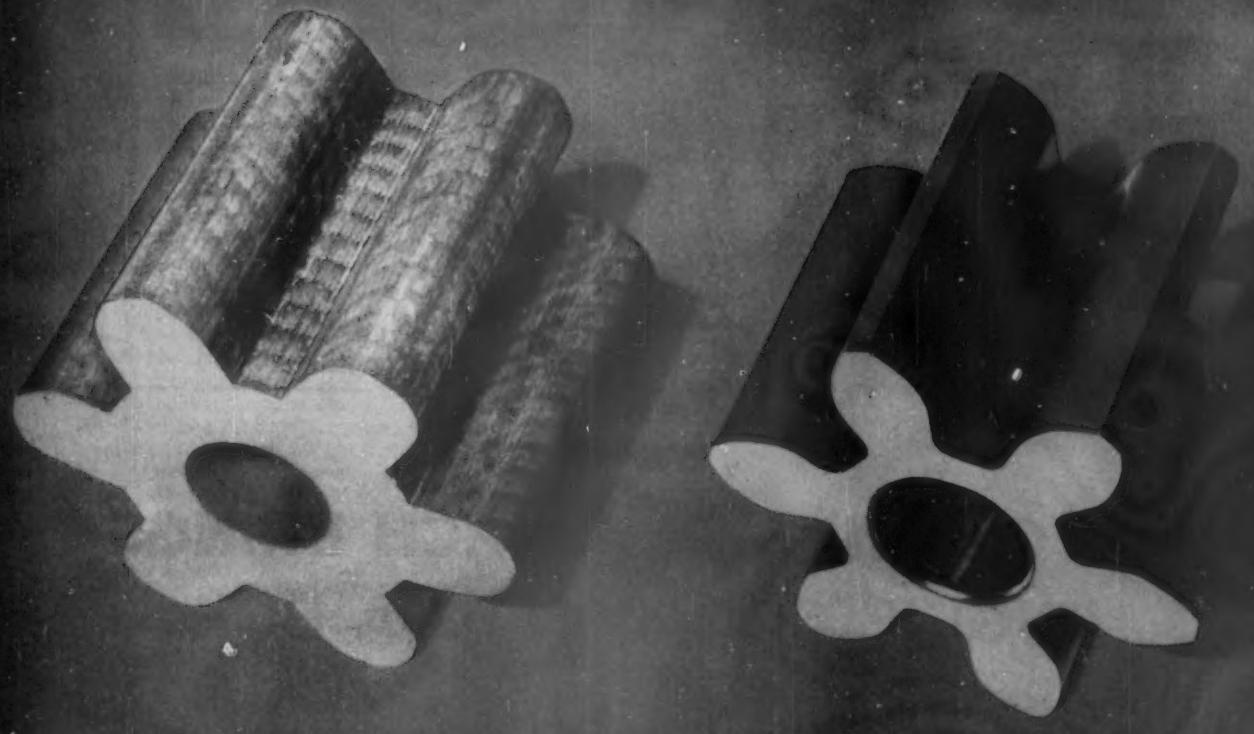
Federated Metals Canada, Ltd.

PLYMOUTH 7-3246

For More Information Write No. 300

on Inquiry Card—Page 34

PURCHASING



*Custom shapes in continuous lengths:*

## **ASARCON®**

### **CONTINUOUS-CAST BRONZE CASTINGS**

Before you design or produce a copper base alloy part, investigate the economy and efficiency of Asarco continuous casting. You can order the alloy and shape you need, in the exact lengths you need. Continuous Cast Asarcon Bronze alloys meet SAE, ASTM, and government specifications—but they are superior to the same alloys cast other ways, in hardness, yield, tensile and impact strength. In fact, you may be able to substitute an Asarcon Bronze for an aluminum or manganese bronze. Write for complete data to Continuous-Cast Department, American Smelting and Refining Company, Barber, N. J. or Whiting, Indiana.

Immediately available from stock: **ASARCON 773 BEARING BRONZE** (SAE 660)—260 sizes of rods and tubes. Complete range of sizes from  $\frac{1}{2}$ " to 9" diameters. Immediately available from stock in 105" lengths. Special shapes produced to order.

Note minimum clean-up necessary  
between casting of this 6-tooth  
pump impeller and finished part.  
(Illustrated parts are 4" in diameter.)

**ASARCO**  
AMERICAN SMELTING AND REFINING COMPANY  
**CONTINUOUS CAST DEPARTMENT**

West Coast Distributor: Kingwell Bros., Ltd., 457 Minna Street, San Francisco, Calif. In Canada.  
Federated Metals Canada, Ltd., Toronto and Montréal. Distributors in many principal cities.

**DOW**  
**INDUSTRY'S  
CHEMICALS:**

*What's  
making news?*

**DOWGARD**, the world's first year 'round cooling system fluid, is now being introduced to the motoring public. DOWGARD protects cooling systems, summer and winter, from overheating, freezing, rust and corrosion. It's an example of an industry-oriented marketing concept that gears Dow products, service and research to the requirements of specific industries. This industry viewpoint examines day-to-day problems of many industries, and often scans the horizon for future ones. Such is the case with Dow's automotive activities.

## AUTOMOTIVE RESEARCH BRINGS ENGINE COOLING TO A BOIL

On the premiere of the new nighttime television series, THE DOW HOUR OF GREAT MYSTERIES, and in newspapers and national magazines, The Dow Chemical Company introduced to the public DOWGARD®—a revolutionary advance in cooling system fluids. A product of long-range automotive research by Dow, DOWGARD is the first cooling system fluid to provide year 'round protection from rust, corrosion, freezing and overheating—from 40°F. below to 240°F. above zero. Installed by an authorized service dealer, DOWGARD has a service life of one entire year. You never have to add antifreeze, rust inhibitors or water pump lubricants during this period. And, this is just the beginning.

**TOMORROW'S COOLANT.** Still in the research stage is another major advance from the Dow Automotive Chemicals Laboratories—an ebullient cooling system that cools by boiling! Ebullient cooling systems in passenger cars can offer many advantages to the motorist. With ebullient cooling, more evenly cooled engines may be designed. Thermostats and water pumps can be eliminated in an ebullient system.

**HEAT EATER.** The idea of cooling an engine by transforming a liquid into vapor is neither new nor novel. Ebullient cooling, as it is called, uses the technique of boiling to "eat up" more heat faster than liquid cooling.

Although ebullient cooling for vehicles is still more in the laboratory than on the road, its general use is a definite possibility. ET-373 is a practical and economical fluid for use with ebullient



EBULLIENT COOLING WITH ET-373 promises more evenly cooled engines with fewer hot spots.

systems in passenger cars and trucks.

**FASTER STOPS.** Equally important as cooling a car is stopping it. Brake fluids—in fact, the entire braking and hydraulic system—have been a subject of interest to Dow research for many years. Heavier cars, greater horsepower, and smaller wheels have placed increased demands upon the brake systems of modern automobiles. To meet this challenge, Dow offers a variety of brake fluids which conform to and exceed the SAE (Society of Automotive Engineers) and Federal specifications.

Dow research chemists are cooperating with automotive engineers in raising the boiling temperatures of brake fluids to fulfill future braking requirements. With the high-boiling formulations Dow has already developed, the automotive engineer can build more efficient braking systems into the models that will grace showrooms for several years to come.

**POWER IN SMALL PACKAGES.** In another area of Dow's Automotive Chemicals Laboratories, the spotlight is on power fluids. Peering into their crystal ball, automotive designers foresee a number of advances in transmission and torque converter design. One, for example, is a transmission—no larger than present ones—that can deliver much more power to the driving wheels.

Anticipating new design innovations like this, Dow researchers are working on power fluids that can do a big job in a small space. These new fluids must be heavier, yet have the viscosity and lubricating properties of today's fluids. Where conventional oils do not work satisfactorily, Dow development engineers are ready to apply synthetic lubricants with improved properties.

A prime example of Dow research in automotive power fluids is work under way to speed the development of central hydraulic fluids in cooperation with the requirements of the automotive industry—a good example of the chemical and automotive industries working together to develop a better automobile for the motoring public.

**ONE BIG FAMILY.** In addition to specialized automotive products such as coolants, brake and power fluids, Dow



TEST TRACKS are kept ice-free in winter and dust-free in summer with hard-working Dow calcium chloride products.

is also a leading producer of chemical intermediates for the transportation industry. Polyglycols, for example, are widely used as lubricants in hydraulic



NEW BRAKE FLUID FORMULATIONS are under constant surveillance in Dow's Automotive Chemicals Laboratories.

fluids. Another family—the glycol ethers—serve admirably in applications ranging from paints, lacquers and varnishes, to brake fluids.

Chemistry's contributions to the automotive industry do not stop with cars themselves . . .

Dow's extensive line of industrial solvents, for example, are widely used by auto makers to clean metal parts and equipment, strip paint and spot-clean upholstery.

Calcium chloride is often used to keep ice and dust off test tracks and parking lots.

Dowtherm® A is a heat transfer agent that operates with far less pressure than steam. It provides pinpoint temperature control in the 350° to 750°F. temperature range in many types of processing operations, such as the manufacture of automotive finishes and the heating of sand mold cores.

\*TRADEMARK

**NAME YOUR INDUSTRY!** Dow's orientation to the chemical requirements of the automotive industry with products, service and research is repeated over and over again in a wide range of industries. These activities are outlined in individual booklets on the automotive, mining, paint and petroleum industries. For a copy, write to us and name your industry. For further information about Dow activities in other industries, contact the Dow Sales office nearest you or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Merchandising Dept. 304EE5-23.

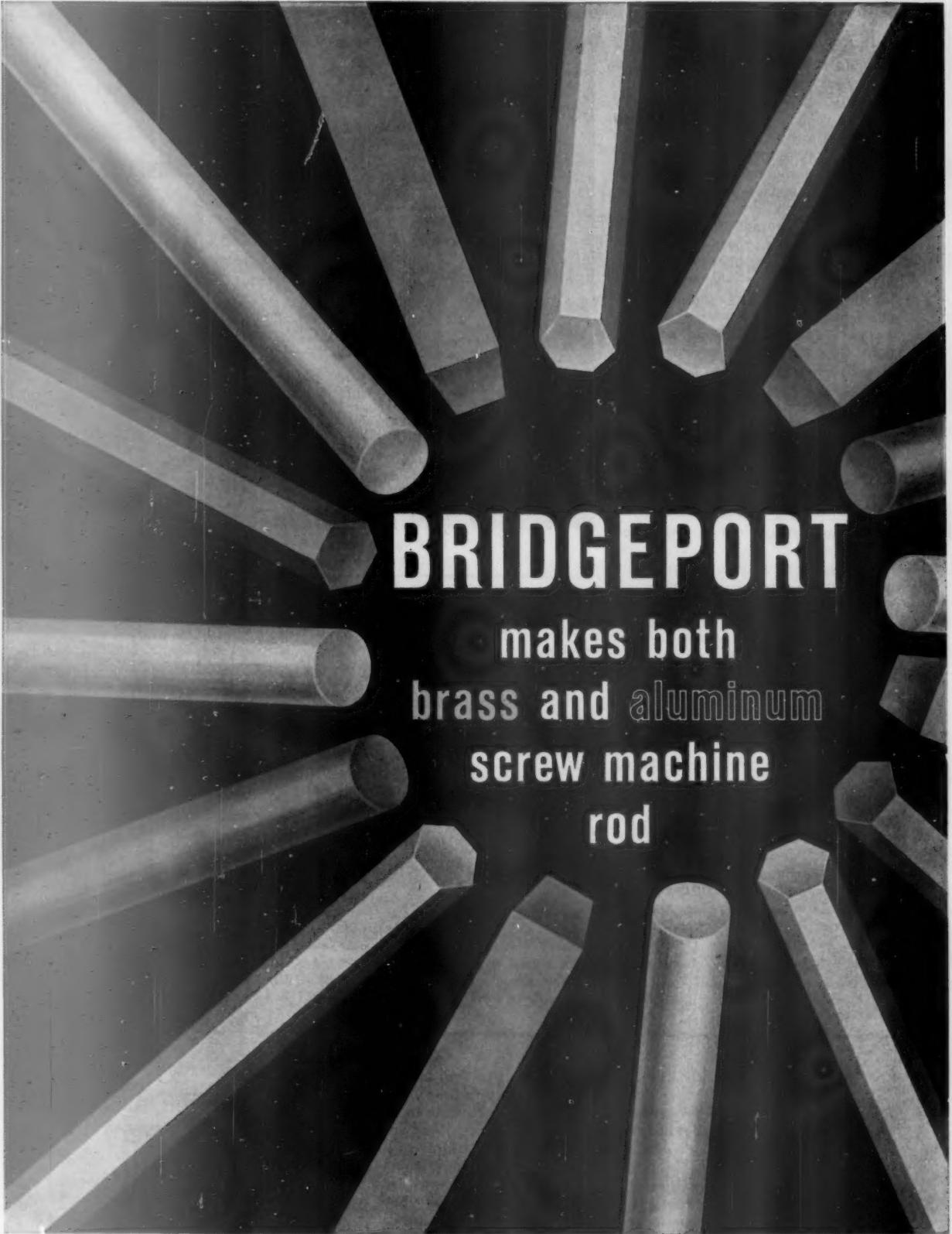
#### THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN



See "The Dow Hour of Great Mysteries" on NBC-TV

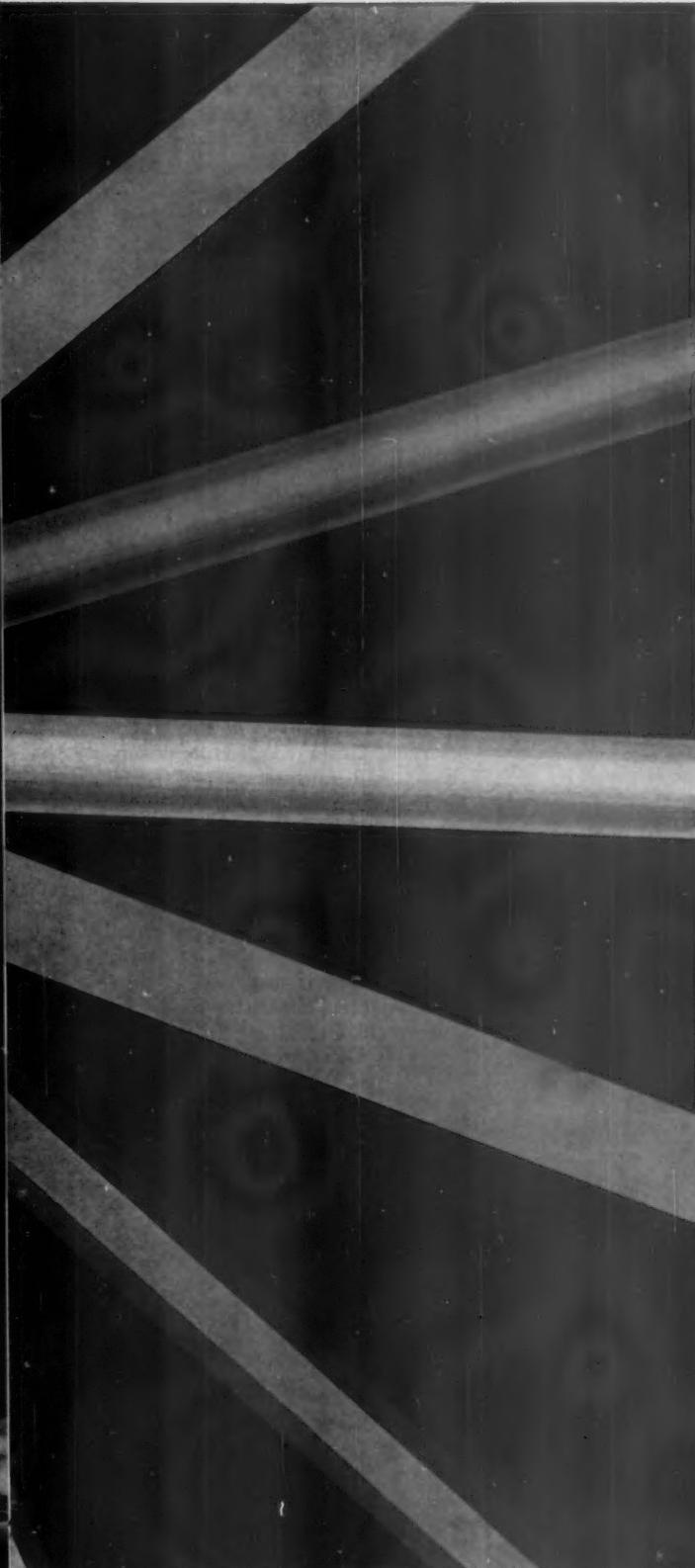
For More Information Write No. 302 on Inquiry Card—Page 34



**BRIDGEPORT**

makes both  
brass and aluminum  
screw machine  
rod

**BRIDGEPORT BRASS COMPANY**



# TIRED OF CONFLICTING CLAIMS ON ALUMINUM vs. BRASS?

The answer's simple...use Bridgeport for your screw machine rod requirements. We make both...know that brass is best for some applications, aluminum for others. That's why you can rely on your Bridgeport Salesman to give you the metal best suited to your specific needs. His recommendation is backed by more than 92 years of Bridgeport metals know-how...and the experience of one of the originators of screw machine stock.

You'll get fast service, too. Bridgeport stocks brass and aluminum screw machine rod—and tube—in warehouses and mills throughout the country for immediate delivery. For full details, call your nearest Bridgeport Sales Office. Or write direct to Bridgeport Brass Company, Bridgeport 2, Conn.

## ALUMINUM SCREW MACHINE ROD

**Advantages:** light weight and low cost—3 times as many pieces per pound; good strength; fine finishing qualities; excellent machinability—low tool wear; high corrosion resistance; non-sparking and non-magnetic.

TYPES	Round and Hexagon.
SIZES	Diameters in 1/64" increments from 1/2" to 3" in standard 12-foot lengths.
ALLOYS	2011-T3 (Standard temper—heat-treated and drawn) 2011-T8 (For applications requiring deep drilling—HT-Drawn-Aged) 2017-T4 (For applications requiring high strength) 5051-T6 (For applications requiring superior corrosion resistance) 2024-T4 (Heat treatable—for applications requiring high strength)

## BRASS SCREW MACHINE ROD

**Advantages:** highest machinability of all—lowest tool wear of all; easiest attainable and most beautiful finish; best corrosion and rust resistance; *highest scrap value*.

TYPES	Round, half-round, oval, square, rectangular, hexagonal and special shapes.
SIZES	Diameters from 1/16" through 4-1/2".
ALLOYS	• Free Cutting Brass • Leaded Commercial Bronze • Tellurium Copper • Sulphur Bearing Copper • Hardware Bronze • Leaded Muntz Metal • Leaded Naval Brass • Aluminum Bronze • Free Cutting Phosphor Bronze • Nickel Silver

**BRIDGEPORT TECHNICAL SERVICE** can help you on all your metals application and fabrication problems...help you reduce costs, improve products, speed production. Ask your Bridgeport Salesman for details. Or write us direct. Dept. 1503, Bridgeport Brass Company, Bridgeport 2, Conn.



**Specialists in Metals from Aluminum to Zirconium**

For More Information Write No. 303 on Inquiry Card—Page 34

MAY 23, 1960

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**YOUR LOCAL  
STEEL SERVICE  
CENTER  
is a STEEL *Specialist***

with years of experience and know-how in maintaining diversified stocks of all types of cold finished steel bars. He can reduce the cost of your in-plant inventories by making quick deliveries for your production demands. To be sure of the finest cold finished steel bars—always specify Wyckoff.



**WYCKOFF STEEL COMPANY**

General Offices: Gateway Center, Pittsburgh 30, Pa.

Branch Offices in Principal Cities

Works: Ambridge, Pa. • Chicago, Ill. • Newark, N.J. • Putnam, Conn.

**WYCKOFF STEEL PRODUCTS**

Carbon, Alloy and Leaded Steels • Turned and Polished Shafting • Turned and Ground Shafting • Large Squares • Wide Flats up to 12 $\frac{3}{4}$ " x 2 $\frac{1}{4}$ " and 14" x 1 $\frac{1}{4}$ " • All types of Furnace Treated Steels including Carbon Corrected Steels

For More Information Write No. 304 on Inquiry Card—Page 34

(Continued from page 232)

creased 100%. Since the new conveyor belt was put in there has been no slippage and as a result no breakage.

The Goodyear Tire & Rubber Co., Akron 16, Ohio  
Write No. 435 on Inquiry Card—Page 34

**Rubber Protects Steel  
From Abrasion**



The steel ends and sides of giant grain hoppers at the Gano-Horace Grain Co., Hutchinson, Kan., had to be replaced regularly after handling 250,000 bushels of grain. After installing Armorline, a B. F. Goodrich adhesive rubber sheeting, over the steel, there is still no sign of wear after 10 months use and handling more than 1 $\frac{1}{2}$  million bushels of grain. The sheeting is designed to protect against abrasion 10 times longer than steel.

Write No. 436 on Inquiry Card—Page 34

**Cobalt-Base Alloy  
Increases Blade Life**



Slicker blades used in a leather tannery are lasting twelve times longer than previously now that they are made of a special cobalt. (Please turn to page 240)

# WOLVERINE TEMPERS TUBING TO CUSTOMER REQUIREMENTS

Do your requirements call for commercial copper or copper alloy tubing in a special temper? One perhaps, which will permit tighter bends, withstand expansion or contribute to better workability?

If you do, Wolverine Tube, Division of Calumet & Hecla, Inc., can meet your needs either from its normal range of tempers or, on your request, will temper your tubing to meet your specifications.

Wolverine's normal range of tempers for commercial tubing includes: *soft annealed* (.040 mm. grain size min.) *light annealed* (.040 mm. grain size max.) *light drawn* (36,000-47,000 psi tensile Rockwell 30T, 30-60) *hard drawn* (45,000 psi min. tensile) (Rockwell 30T-55 min.), Drawn General Purpose (36,000 psi min. tensile) Rockwell 30T-30 min. Frequent inspections throughout the production process assure that tempers will meet customer requirements.

Before placing your next commercial tubing order talk to your Wolverine sales representative. He can show you the many ways in which Wolverine Tube can help you obtain maximum value for your tubing dollar. Write, too, for a copy of the Commercial Tube Catalog.



**WOLVERINE TUBE**

DIVISION OF

**Calumet & Hecla, Inc.**

DEPT. A, 17250 SOUTHFIELD RD., ALLEN PARK, MICH.

Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

J-8880

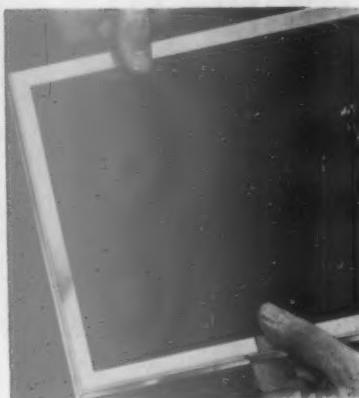
PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA • SALES OFFICES IN PRINCIPAL CITIES

For More Information Write No. 305 on Inquiry Card—Page 34

(Continued from page 238)  
base alloy. At the Sides Leather Division, A. C. Lawrence Co., the blades are attached to a hand tool used to smooth wet skins onto a pasting plate. Their life was increased when they were made from Haynes Stellite alloy No. 6K.

Write No. 437 on Inquiry Card—Page 34

#### Fine Grain Brass Ends Polishing



A maker of mirror frames for medicine cabinets has saved \$10,000 a year on polishing costs alone. By changing to brass strip of a different grain size he was able to save 17 cents per frame on polishing with no increase in other production costs. Brass takes 90 degree bend without difficulty.

Write No. 438 on Inquiry Card—Page 34

#### Stainless Filter Cloth Cuts Maintenance Costs



In filtering industrial solutions, cotton mesh cloth requires frequent replacement. And the cloth often cannot be woven fine enough to make recovery profitable. Filter

cloth finely woven of stainless steel wire resists corrosion and abrasion, provides long trouble-free service life. In an application involving a 600-foot long cable at Sudbury, Canada, damp and corrosive atmosphere led to a test of stainless steel. Despite higher initial costs, stainless steel wire provided amortized cost savings of 79% over galvanized steel wire. Cost per month per foot of stainless cable ran \$.36 versus \$1.69 for galvanized metal.

Write No. 439 on Inquiry Card—Page 34

#### Stainless Screens Outlast Carbon Steel 2:1

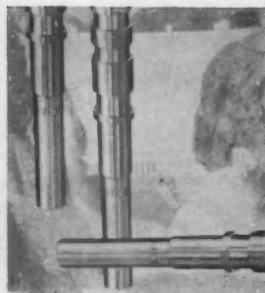


In handling minerals, maintenance reports from the Clyde and Russelton Mines cite stainless steel shaker screens are outlasting those of carbon steel by two to one. They also report that stainless reduces down-time and eliminates binding. Stainless steel's hard smooth surface lets bulk materials pass easily with little perceptible wear, even after many years service.

Write No. 440 on Inquiry Card—Page 34



"I don't want an appointment today—I just dropped by to finish a story I started last week."



HOOVER DAM

## call operator 25

Your J&L stainless steel distributor can serve you better because *J&L serves him better*, backing him with the full facilities of J&L's Stainless and Strip Division.

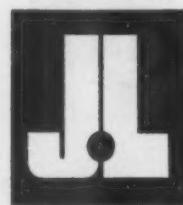
Your J&L distributor can reduce your costs by providing a complete range of pre-production services, and doing it economically! He can save you the capital investment required to maintain long term inventories; he can help you eliminate the costs of overhead connected with stocking, accounting, and the inevitable losses incurred through waste and obsolescence due to specification changes.

Technical assistance in solving production problems is also available from your J&L distributor...when those problems are connected with an application using stainless steel, J&L's own staff of technical specialists will promptly answer your distributor's call for additional help.

Even when advanced research is required you can call on your J&L distributor in confidence. He will be happy to discuss your problem because he knows he is backed by one of the world's most respected teams of metallurgists—J&L's own staff in laboratories at Detroit and the famous Graham Research Laboratories at Pittsburgh.

Your J&L distributor is as near as your telephone. Call Western Union Operator 25 for the name of your J&L distributor of Consistent Quality stainless steel.

**J&L — a leading producer of stainless steel and precision cold rolled strip steels**



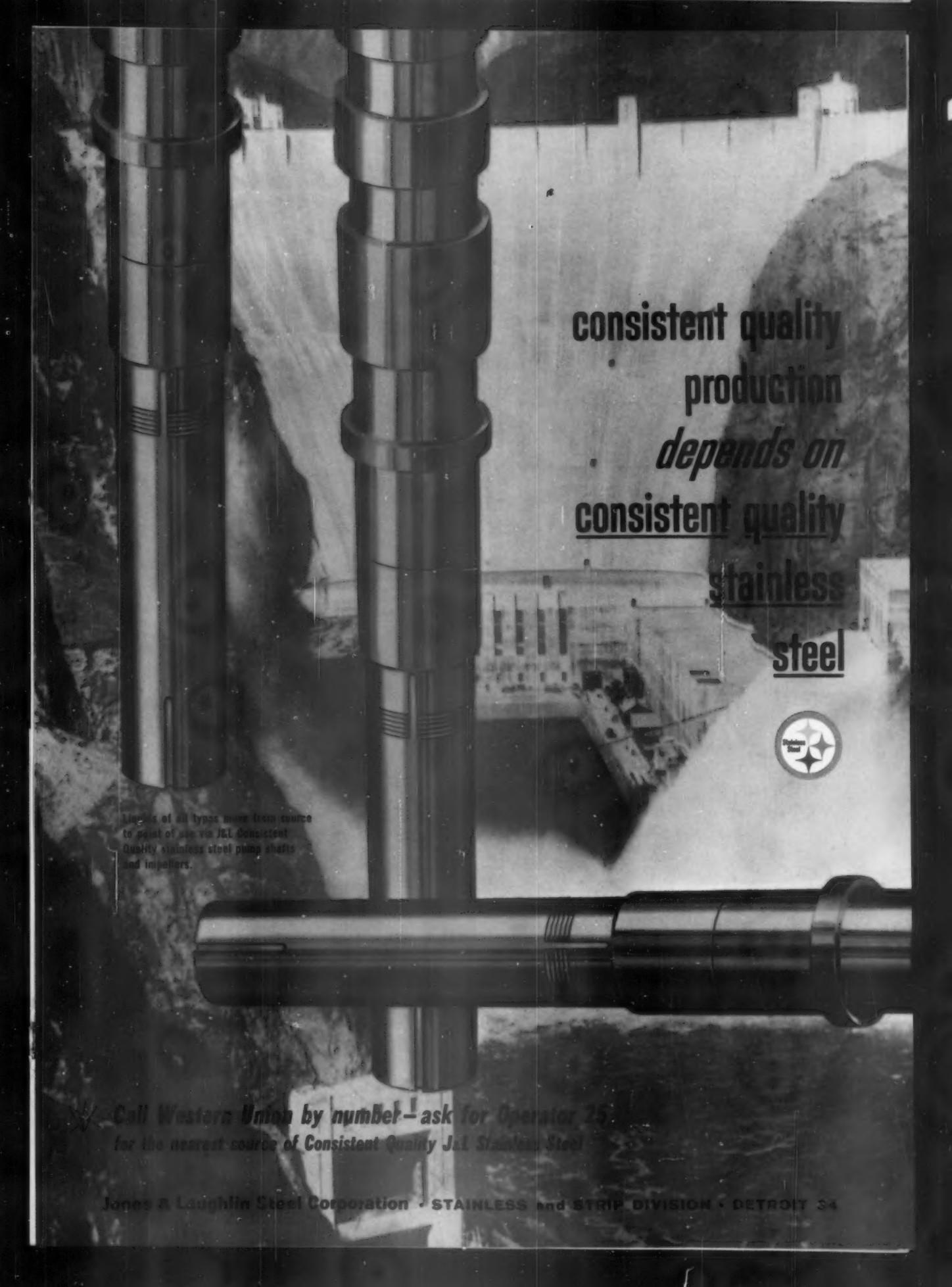
## STAINLESS

SHEET • STRIP • BAR • WIRE

For More Information Write No. 306

on Inquiry Card—Page 34

PURCHASING



**consistent quality  
production  
*depends on*  
consistent quality**

**stainless**

**steel**



Liquids of all types move from source to point of use via J&L Consistent Quality stainless steel pump shafts and impellers.

Call Western Union by number—ask for Operator for the nearest source of Consistent Quality J&L Stainless Steel

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • DETROIT 34



**All tied up in one neat "package" . . .  
...the PLUS VALUES of Synthane Laminated Plastics**

**FROM ONE MATERIAL**

**SYNTHANE** is the name for a family of thermosetting plastic laminates valued generally for their electrical, mechanical and chemical properties in combination. Synthane laminates are important specifically for such properties as:

**Dielectric Strength**

**Flexural Strength**

**Moisture Resistance**

**Low Dissipation Factor**

**Impact Strength**

**Light Weight**—less than half the weight of aluminum

**Chemical Resistance**

**Ease of Machining**—using standard metal or wood shop equipment

**Wear Resistance**

**Dimensional Stability**

**Compressive Strength**

**FROM ONE SOURCE**

**Many Grades, Many Forms**—Over 35 standard grades alone and many special grades available . . . in sheets, rods, tubes, fabricated parts.

**Exceptional Fabricating Facilities**—Synthane Corporation operates the world's largest shop for the exclusive fabrication of plastic laminates. Many parts are also made by molded-laminated or molded-macerated techniques or by combining these methods with machining.

**Quality Control from Start to Finish**—Synthane tests continually for the quality of the raw materials and performance of finished materials and parts. Most important is the spirit of our people who make it their job to watch the production and fabrication of Synthane at every step.

Laminated Plastics for Industry

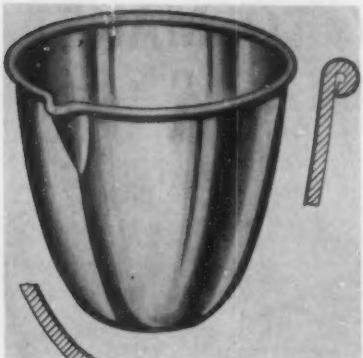
**SYNTHANE**  
CORPORATION OAKS, PENNA.

For More Information Write No. 307 on Inquiry Card—Page 34

Send  
for complete  
catalog



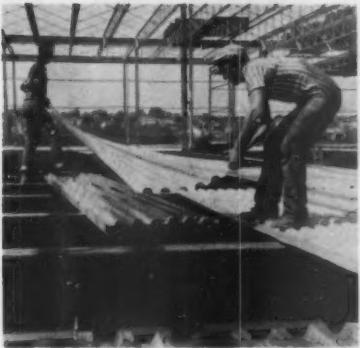
**Platinum Clad Metal Cuts  
Apparatus Costs 80%**



Crucibles and dishes made of platinum clad stainless steel are cutting apparatus costs at a major analytical laboratory. Used in high temperature evaporation work involving acids, the clad vessels can replace solid platinum for most purposes and at one-sixth of the cost. The clad metal was developed by the Metals and Controls Division of Texas Instruments, Inc.

Write No. 441 on Inquiry Card—Page 34

**Steel Slabform Saves 30%  
Over Wood Forms**



I. Reindollar & Sons, Inc., York, Pa., contractors, is saving approximately 30% through use of Bethlehem Steel Co.'s extra heavy-duty galvanized steel Slabform in place of conventional wood forms in laying floors for the new warehouse they constructed for Cole Steel Equipment Co. In addition to this saving, Reindollar says, it reduced construction time for the project by 38 days, thanks to the speed of erection of Slabform and the time saved through not having to strip forms, as with wood.

Write No. 442 on Inquiry Card—Page 34

**THE  
SIGNAL  
CORPS  
SAID  
"NO" . . .**

*till Miller said*

**PHOSPHOR BRONZE**

This flea-like component for an electronic tube socket was all that stood between the manufacturer and a good-sized contract. Before acceptance, however, the part had to undergo a rigorous manual test prescribed by the Army Signal Corps, and none of the metals tried by the manufacturer would measure up!

Miller technical people went to work to find the answer, and in short order they developed a specially treated phosphor bronze alloy that enabled the manufacturer to pass the test with flying colors! It combined rigidly controlled grain size, elongation in excess of 10% and still retained a remarkable tensile strength of 100,000 pounds per square inch!

Miller quality phosphor bronze, coupled with expert personal attention, helped save this order. And perhaps we may soon have the opportunity to perform a like service for you.



**ROLLING MILL  
DIVISION**

**THE MILLER COMPANY  
MERIDEN, CONN.**

Approximately 15 times  
actual size

...WHERE PHOSPHOR BRONZE IS THE MAIN LINE—NOT A SIDELINE

For More Information Write No. 308 on Inquiry Card—Page 34

# "WE'RE GOING TO BLOW IN 43% MORE PIG IRON CAPACITY TO MAKE MORE GRANITE CITY STEEL"



"This is Granite City's new blast furnace. We're building the shell and much of the superstructure off-site. Then, when the old furnace is torn down, we'll move this 650-ton shell into place. This will save about two months' down time. The new blast furnace will have twice the capacity of the one it's replacing. When it is blown in, it will boost our annual pig iron capacity to 1,100,000 tons—provide more of the hot metal we need to support our increasing ingot capacity. This is another way Granite City Steel is growing—assuring you a dependable source for steel."

For More Information Write No. 309 on Inquiry Card—Page 34

244



**GRANITE CITY STEEL**  
STEELMAKERS TO MIDDLE AMERICA

HOME OFFICE: Granite City, Illinois • SALES OFFICES: Dallas • Memphis  
Kansas City • St. Louis • Minneapolis • Houston • Moline • Tulsa



PURCHASING



## FIRESTONE LATEX BUILDS A STIFFER HAND INTO CARPETS AND FOAM

A Firestone product-specialized FR-S® latex lends a hand to carpet backing, makes carpets stronger, longer lasting, more attractive and provides greater dimensional stability. This same versatile latex gives foam carpet backing extra stiffness per unit of weight as well as greater tear strength. It's Firestone FR-S 174, a styrene-butadiene resin latex. Put it to work for you by calling your latex compounder or a Firestone Technical Service Man. Write Firestone Synthetic Rubber & Latex Co., Dept. 24-5, Akron 1, Ohio.

Copyright 1960, The Firestone Tire & Rubber Co., Akron, Ohio

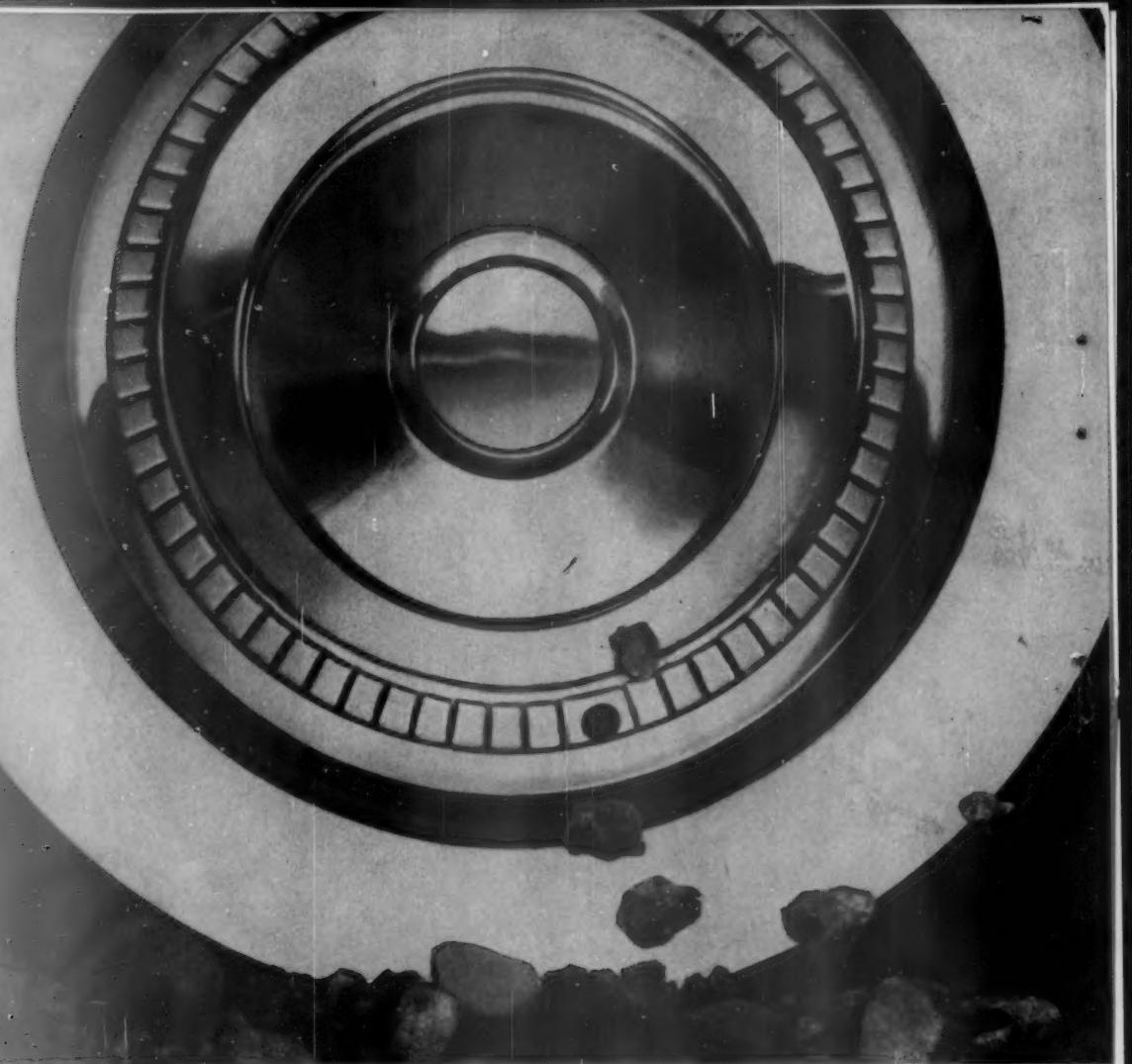
**Firestone**  
SYNTHETIC RUBBER & LATEX CO.  
FR-S AKRON 1, OHIO  
MAKING THE BEST TODAY STILL BETTER TOMORROW

For More Information Write No. 310 on Inquiry Card—Page 34

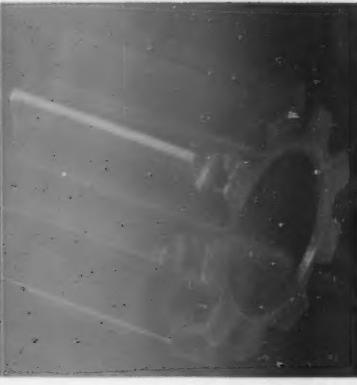
MAY 23, 1960

For More Information about ad on following page Write No. 311 on Inquiry Card - pg. 34→

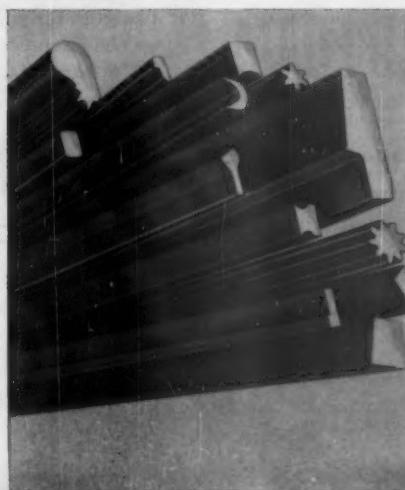
245



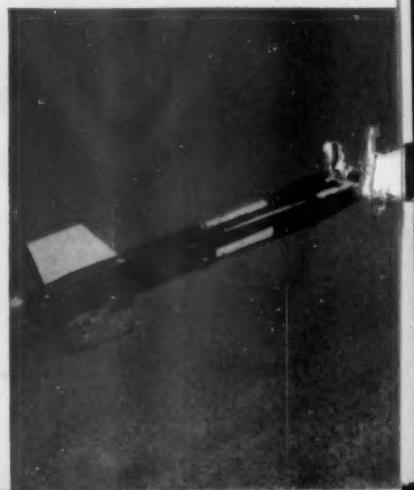
THE "BEAUTY" OF REPUBLIC SPECIAL SECTIONS is that built-up, interlocking, or associated parts can be eliminated. Formed to the predominating cross section of the shape, Republic Cold Drawn Special Section Bars assure strong, one-piece parts . . . longer wearing parts that cost less to produce. Republic Special Sections are available in carbon, alloy, and stainless steel.



THE "BEAUTY" OF REPUBLIC COLD DRAWN ALLOY STEEL in this drive pinion is strength and toughness needed to withstand severe torque, impact, and prolonged wear—plus the benefit of better machinability at reasonable cost. In addition to alloy, Republic offers cold drawn carbon, stainless, and titanium bars.



THE "BEAUTY" OF TITANIUM in North American Aviation's X-15 research vehicle is its dependability under extreme high and low temperature fluctuations. Republic—the world's largest producer of stainless and alloy steels—is supplying type RS-110A titanium alloy for the X-15.



# THE "BEAUTY" OF STAINLESS

**...parts subjected to rough service prove it!**

Design and performance advantages unsurpassed by any other commercial metal . . . that's the "beauty" of stainless steel.

Take wheel covers, for example, or any part that must stand up to rough, tough service. No need to over-design with stainless. The metal's exceptionally high strength-to-weight ratio permits the use of lighter gages without sacrificing the strength needed to withstand denting and abrasion. And, no need

for expensive platings or coatings to enhance the corrosion-resistance or stay-new-forever appearance of stainless.

High-style, functional, easily formed stainless steel is supplied by Republic in more than 30 types for thousands of applications. Metallurgical service available to help you select, apply, and process. Mail the coupon for more information on the metal that does more than just go along for the ride.



**REPUBLIC STEEL**

*World's Widest Range  
of Standard Steels and Steel Products*



This STEELMARK of the American Steel Industry tells you a product is made of Stainless Steel. Look for it when you buy. Place it on products you sell.

**REPUBLIC STEEL CORPORATION**

DEPT. PH-9140-A      1440 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on:

- |  |   |
|--|---|
| <input type="checkbox"/> Stainless Steel | <input type="checkbox"/> Alloy Steel          |
| <input type="checkbox"/> Titanium        | <input type="checkbox"/> Special Section Bars |
| Have a metallurgist call:                |   |
| <input type="checkbox"/> Stainless Steel | <input type="checkbox"/> Alloy Steel          |
|  | <input type="checkbox"/> Titanium             |

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**FROM  
.010"  
TO  
.0002"  
SOMERS  
IS  
No. 1  
FOR  
STAINLESS  
STEEL  
THIN STRIP®**

302,304,305,316,321,347,430  
17-7PH, PH-15-7MO plus various  
high temperature alloys and rare  
metals are precision produced by  
Somers up to 25" wide in gauges  
as thin as .001", narrower widths  
to .0002".

Unique annealing and finishing  
equipment assure uniform temper,  
commercial bright anneal finish,  
close width as well as thickness  
tolerance and #4 edge on either  
coils or cut lengths.

You can rely on Somers, specialists in  
rolling thin metal for over 50 years,  
for the engineering and production to  
meet your most exacting standards.  
Write for confidential data blank  
or field engineer for analysis of  
your special problem — no obligation,  
of course.

FOR EXACTING STANDARDS ONLY



Somers Brass Company, Inc.  
128 BALDWIN AVE., WATERBURY, CONN.

For More Information Write No. 312  
on Inquiry Card—Page 34

**Malleable Castings  
Cut Part Cost 65%**



Wear characteristics, machinability, and strength were the reasons Stearns Electric Corp., Milwaukee, chose malleable iron castings to replace three brass parts in its magnetic disc brake. In switching to malleable, Stearns saved 65% of the cost of the old part—the difference between \$4.20 for brass and \$1.48 for malleable. Weight was reduced 14% for all three parts. The Milwaukee Malleable and Grey Iron Works redesigned the part.

Write No. 468 on Inquiry Card—Page 34

**Service Life Tripled  
With Neoprene Hose**



Flexible neoprene hose outlasts metal tubing three to one on John Deere & Co. farm fertilizer equipment, reports the Thermoid Division, H. K. Porter Co. Metal tubing clogged, bent, and rotted with normal use. Now, a ribbed hose uses the bending and squeezing action to keep fertilizer from clogging the passage. The neoprene content of the hose prevents chemical corrosion and is unaffected by temperature changes that cause metal sweat and collect fertilizer.

Write No. 469 on Inquiry Card—Page 34

**Special Lubricant Works  
In Extreme Conditions**

In the more than 18 months it has been using Molub-Alloy lubricants, the Lavaland Heights Block Co., Albuquerque, N. M., has had no down-time, replacement, or failures on its conveyor chains and bearings. In the manufacture of light-weight concrete blocks all equipment operates in an environment of abrasive grit and dust. Chains are cleaned automatically and continuously with brushes and water sprays. Conventional lubricants did not prevent frequent breakdowns and excessive wear of parts. Molub-Alloy has not only eliminated down-time but has meant savings in the cost of repair labor and replacement parts.

Write No. 470 on Inquiry Card—Page 34

**Nylon Extrusion  
Saves Maintenance Cost**



At the Zanesville (Ohio) Transit Co. bus windows next to driver are opened and closed frequently. Contact surfaces are thus subject to heavy wear. Felt strip in the sash channel wore away in six months and resultant metal contact soon required replacement of entire sash and frame at a cost of \$68. A nylon extrusion, manufactured by the Polymer Corp., was installed over the frame edges at a cost of \$3.75 per window. After six months there is no wear and years of service are expected.

Write No. 471 on Inquiry Card—Page 34

**130% Production Gain With  
Diamond Grinding Wheels**

At Kennametal, Inc., Latrobe, Pa., one 16 in. OD x 2 in. face diamond grinding wheel outlasted

(Please turn to page 253)

For More Information about ad on facing page  
Write No. 313 on Inquiry Card—page 34

**Allied Chemical Announces 50% Boost  
in HF Capacity at Nitro, W. Va. Plant**

New York, N. Y. (Special)—Allied Chemical's General Chemical Division announced today that it is expanding by 50% the productive capacity of its anhydrous hydrofluoric acid plant at Nitro, W. Va. This is one of several developments which strengthen Allied Chemical's position as a major producer of hydrofluoric acid.

**OVER 1,000,000 TONS OF ADDED FLUORSPAR  
RESERVES ACQUIRED BY ALLIED CHEMICAL**

New York, N. Y. (Special)—Acquisition of major new reserves of fluorspar, totalling more than a million tons, has been announced by Allied Chemical Corporation. These buttress the Corporation's position in fluorine chemistry and provide additional raw material resources for long future hydrofluoric acid production.

## **2 More Big Reasons for Making General Chemical Your HQ for HF**

General Chemical recently announced two developments of interest to every consumer of hydrofluoric acid—a 50% increase in anhydrous HF capacity at Nitro, W. Va., and the acquisition of more than 1,000,000 tons of additional fluorspar reserves. Both announcements underscore General's position as the nation's leading supplier of aqueous and anhydrous hydrofluoric acid.

Here are more good reasons why it pays to make General your *HQ for HF*:  
**Eight HF supply locations, three producing plants!** General Chemical main-

tains eight HF supply points. Of these, three plants located in North Claymont, Delaware; Baton Rouge, Louisiana; and Nitro, West Virginia, make General Chemical the *only* supplier offering shipment of anhydrous as well as aqueous from more than one producing location.

In addition, General Chemical maintains five aqueous HF bulk storage and packaging stations at Buffalo, N. Y.; Chicago, Ill.; Cleveland, Ohio; El Segundo (Los Angeles), Calif.; and Pittsburgh, Pa. These five points back

each other up and further assure service and availability of HF at all times, under all conditions.

**Basic position!** General Chemical owns and operates its own fluorspar mines and mills . . . and is the country's leading producer of sulfuric acid. This basic position in the essential raw materials for hydrofluoric acid production is your best assurance of dependable supply.

If you'd like more information as to how we can serve you, just drop us a line. Why not do it now?

*Basic to America's Progress*



**GENERAL CHEMICAL DIVISION**

40 Rector Street, New York 6, N. Y.

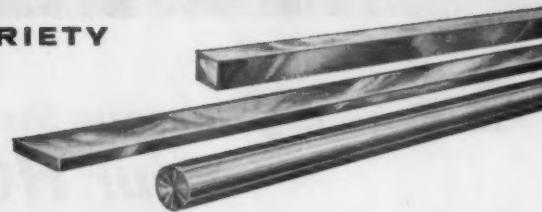


**... completes the picture**

with **QUALITY—QUANTITY—VARIETY**

Satisfy all your tool steel requirements at your Uddeholm Specialty Steel Service Center, where you can always receive expert technical aid in the selection and use of just the right type for your needs.

**Precision Ground Tool Steel**—flatstock—always free from decarburization—supplied in sizes close to or exactly that of the finished tool or die with extremely close dimensional tolerances. UHB 46 (SAE 01) is stocked from 1/64" to 2" thick—1/2" to 14" wide; UHB 151 (SAE A1) from 1/8" to 2" thick by 1" to 10" wide . . . in square or rectangular stock—18" long. Many sizes stocked in 36" lengths. Uddeholm, producers of the finest tool steels, assures you of the highest quality standards!



**Drill Rods**—stocked in UHB, UHB "Extra" (SAE W1), UHB 46 (SAE 01), and Tri-Mo (SAE D2)—36" lengths from Number 80, (.013") to 2" diameter.

**One Source For All Tool Steels**—In addition to precision ground flatstock and drill rod, Uddeholm Specialty Tool Steel Service Centers stock Swedish Quality hot-rolled bars, hollow bars, special shapes, in air, oil, and water hardening grades . . . over 2800 combinations of grade, size and analysis from which to select.

**Write today for Stocklist No. 13—Free Technical Literature**



**UDDEHOLM COMPANY OF AMERICA, INC.**

155 East 44th Street, New York 17, N.Y. • MURRAY HILL 7-4575

BRANCH OFFICES & WAREHOUSES: Long Island City, N.Y.: 22-14 37th Ave., MURRAY HILL 7-4575 Cleveland: 4540 East 71 Street, Diamond 1-1110  
Los Angeles: 5037 Telegraph Road, ANgelus 2-5121 Newington, Conn.: 2175 Berlin Tpke., P.O. Box 136, Mohawk 6-5461

DISTRICT REPRESENTATIVES: Chicago: Frank J. Mackin, Leroy E. Marshall, 55 East Washington, STate 2-1649

Detroit: Warren H. Nugent, 17304 Lahser Road, KENWOOD 5-6340 Philadelphia: Frank T. Campagna, 1418 Walnut St., PENNypacker 5-2114

TOOL STEEL WAREHOUSE DISTRIBUTORS: Rockford, Ill.: Rockford Industrial Steel Service, 2229 Twenty-Third Ave., WOODLAND 3-5463

For More Information Write No. 314 on Inquiry Card—Page 34

For More Information about ad on following page Write No. 315 on Inquiry Card - pg. 34→

PURCHASING

# STEEL

# QUALITY

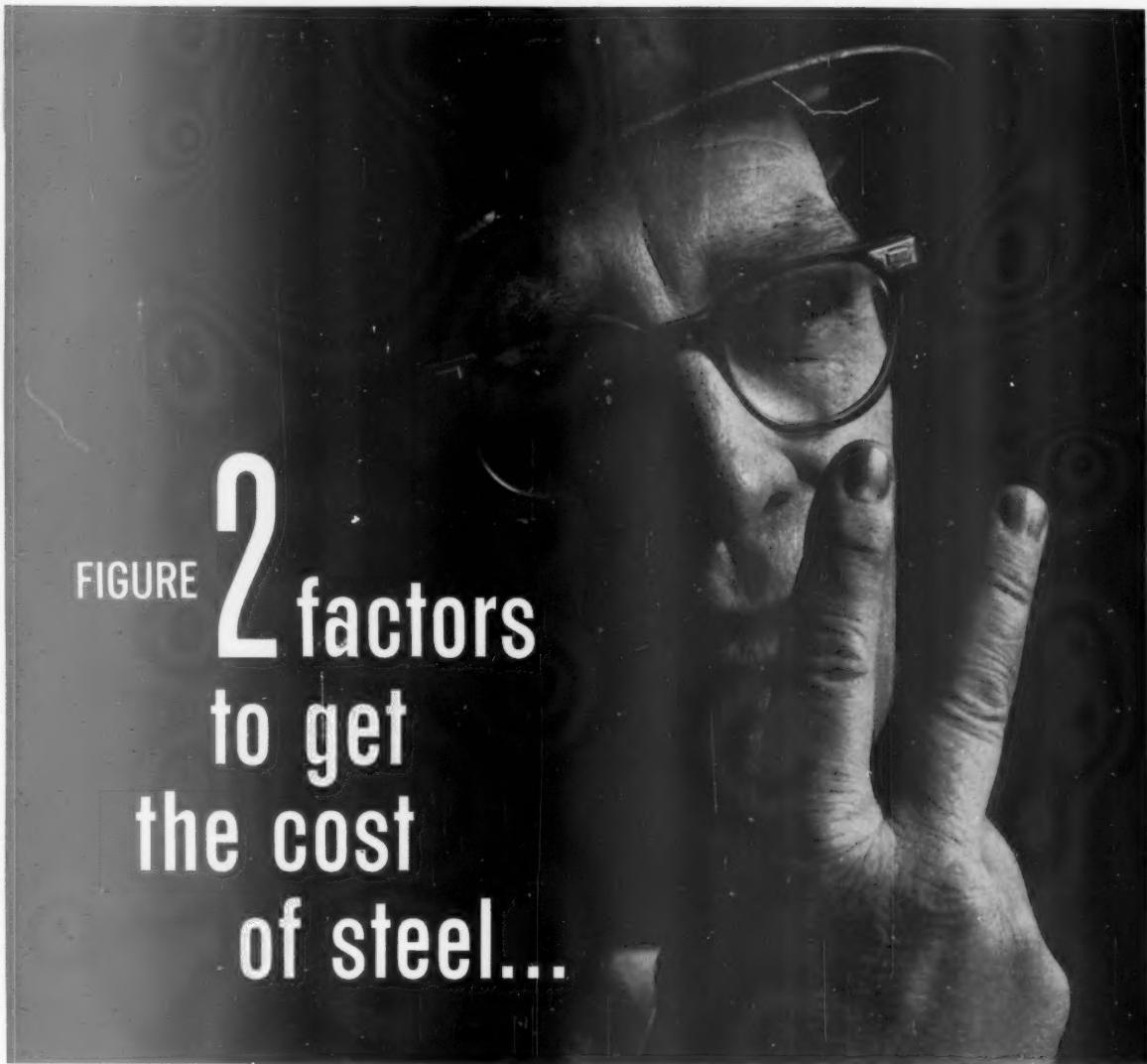
STEEL is a furnace, burning like the sun. It is a magic metal, born in fire. Steel serves you as no other low-cost metal can. It is everybody's metal. Steel. 2600 pounds of it in an average American car. 10,000 feet of it in an off-shore oil well. 2 pounds of it in a child's rugged toy. 16 inches of it in a handy, light tin can. Youngstown is carbon, alloy and Yoloy steel to cut, form, machine, stamp, weld or draw. Steel to build with, steel to use. From the furnaces of Youngstown, growing force in steel.

YOUNGSTOWN is steel plus quality. Physical quality that steel-eyed men in 39 Youngstown mills deliver. Chemical quality that specialists in metallurgy provide. Exacting quality that must meet the test of electronic devices. Cost-cutting quality that works with Youngstown service to help you design things better, to make things better. Youngstown steel is steel made for you, steel you can depend on. Quality steel. The kind you'd expect from modern and dynamic Youngstown, growing force in steel.



## Youngstown - growing force in steel

THE YOUNGSTOWN SHEET AND TUBE COMPANY, YOUNGSTOWN, OHIO ATLANTA BOSTON BUFFALO CHICAGO CINCINNATI CLEVELAND COLUMBUS DALLAS DENVER DES MOINES DETROIT GRAND RAPIDS HOUSTON INDIANAPOLIS KANSAS CITY LOS ANGELES MILWAUKEE MINNEAPOLIS NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS SAN FRANCISCO SEATTLE TULSA WASHINGTON



FIGURE

# 2 factors to get the cost of steel...

## COST OF POSSESSION is an important addition to price!

What are the costs of possession when you put steel in inventory? Many are hidden. Run your eye down the chart at the right . . . it will help you find them.

Many smart, well-informed steel users find they save money by using the stocks, facilities and technical knowledge of their Steel Service Centers. They deliver steel when you want it, cut to exact size, ready for use. Your capital is freed for

more profitable use.

Compare *all* of your costs, including *cost of possession*, with the price and *freedom from risk* of buying steel from your Steel Service Center. Get the booklet, *What's Your Real Cost of Possession for Steel?* from your nearby Steel Service Center. Or write to Steel Service Center Institute, Inc., 540-E Terminal Tower, Cleveland 13, Ohio.



...YOUR STEEL SERVICE CENTER

For More Information Write No. 316 on Inquiry Card—Page 34

**COST OF POSSESSION  
FOR STEEL IN YOUR INVENTORY**

Per ton delivered	_____
Cost of capital:	_____
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	_____
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Other costs:	_____
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
	<b>TOTAL</b>

**COST OF FREEDOM-FROM-RISK STEEL  
FROM YOUR STEEL SERVICE CENTER**

Per ton, cut-to-size, and delivered	_____
	<b>TOTAL</b>

(Continued from page 248)

eight silicon carbide wheels in the finish grinding of solid carbide cylinders. Although the diamond wheel cost \$1136.25 compared to \$545.76 for the eight silicon carbide wheels, it ground a total of 36,976 pieces compared to 16,023 ground by the eight carbide wheels together. The production gain is calculated to be 130% with a much lower wheel cost per piece. Furthermore, while it was not possible to hold tolerances closer than .001 in. with the silicon carbide wheels, tolerances of .0005 were held easily with diamond wheels. The use of diamond wheels eliminated frequent wheel dressing and constant dimensional checking of the part to watch for wheel breakdown.

Write No. 472 on Inquiry Card—Page 34

**Zinc Die Casting Saves  
75% Production Cost**



A commutator mounting bracket for a stencilling machine, once made from aluminum, has been converted to a zinc die casting with a production cost saving of 75%. Made for the Defiance Machine & Tool Co., St. Louis, by A. B. Mueller Co., the zinc part cost \$1.00 compared to \$4.00 for the aluminum. The change to zinc reduced machining time, increased tensile strength, made part less bulky and produced a smoother surface.

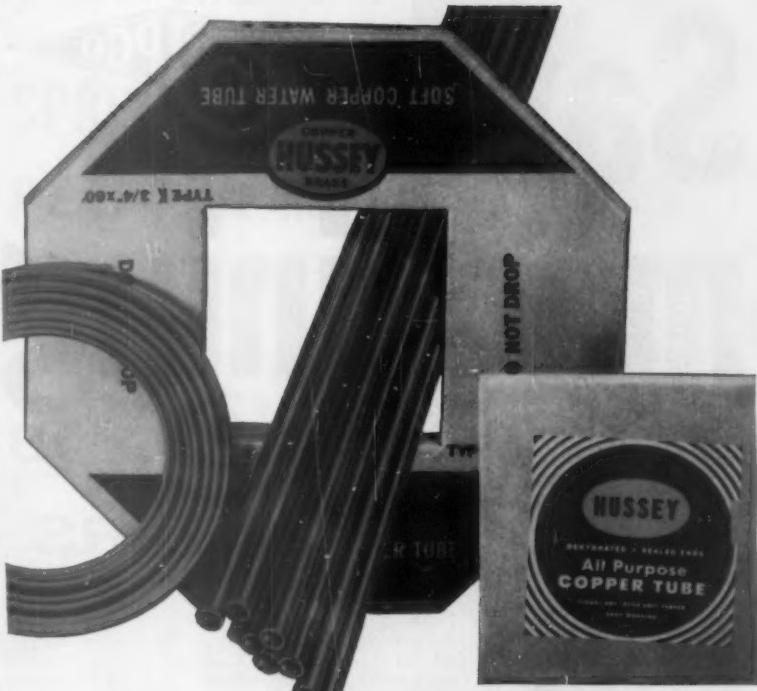
Write No. 473 on Inquiry Card—Page 34

**High-Strength Fasteners  
Insure Antenna Performance**

Aluminum high-strength fasteners are used in assembling the world's largest 3-axis antenna.

(Please turn to page 254)

MAY 23, 1960



**For rigid requirements  
specify flexible**

# Copper Tube

Of course, copper tube is flexible in the sense that it forms easily. It is flexible, also, in its range of applications because the combination of properties it provides is not found in any other material.

For the finest quality copper tube, always specify Hussey . . . available straight or coiled in sizes, wall thicknesses and tempers to meet your most critical requirements.

**HUSSEY COPPER AND BRASS  
TUBING & PIPE**

• Copper All Purpose Tube

• Copper Water Tube  
(Types K, L, M)

• Copper Refrigeration Tube  
(Dehydrated and Sealed Ends)

• Copper Pipe

• Brass Tube  
(also square, rectangular,  
hexagon)

• Red Brass Pipe



## C. G. HUSSEY & COMPANY

Division of Copper Range Co.

Rolling Mills and General Offices  
**PITTSBURGH 19, PENNSYLVANIA**

7 Convenient Warehouses

PITTSBURGH CLEVELAND NEW YORK CHICAGO  
ST. LOUIS PHILADELPHIA CINCINNATI

For More Information Write No. 317 on Inquiry Card—Page 34

# Save machining

**with AMPCO® 18**  
**Centrifugally Cast**  
**STOCK BARS**

For convenience in stocking, end-label shows I. D. and O. D. sizes to which bars finish.



Ampco 18 resists wear, shock, impact—lasts many times longer than ordinary bronzes. Ideal for bearings, bushings, gears, etc.

Only finish-machine cuts are needed on Ampco Metal Centrifugally Cast Stock Bars. They're semi-finish machined all over — finish allowance, 1/16" on O. D. and I. D.

Your Ampco stocking distributor can supply Ampco 18 Stock Bars in 90 sizes up to 10" O. D. 12½" lengths. Call him for prompt service. **D-60**

**AMPCO METAL, INC.,** Dept. 374E, Milwaukee 46, Wis.  
 WEST COAST PLANT: BURBANK, CALIFORNIA      SOUTHWEST PLANT: GARLAND (DALLAS COUNTY), TEXAS

For More Information Write No. 318 on Inquiry Card—Page 34

## CENTRIFUGALLY SPUN STEEL TUBES

Size range OD's from 2.25 to 50" walls from .25 to 4"

UP TO  
**50"**  
o.d.

Here is steel tubing with dense, non-directional grain structure which is less costly to machine. Inherent dimensional stability and concentricity make dynamic balance easier to attain in finished products. Available in carbon, alloy and stainless steels.

Write today for complete catalog

**C.A. ROBERTS CO.**  
*Steel Tube Specialists*

Dept. O-5 • 2401 25th Avenue • Franklin Park, Illinois

**6 Warehouses serving the midwest**  
 CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • TULSA • KANSAS CITY

For More Information Write No. 319 on Inquiry Card—Page 34

(Continued from page 253)

Huck OS structural blind rivets and Huckbolt fasteners are used for all structural assemblies in the deflector and framework. Designed and developed by the



Philco Western Development Laboratories the antenna is to be used to receive telemetered information from missiles in flight. Structural rigidity is essential to provide unusually accurate tracking response.

Write No. 474 on Inquiry Card—Page 34

## Solid Sheathing Speeds Builder's Output



A Portland, Ore., builder found his carpenters laid up sheathing at a rate of 1000 feet in seven hours when using Sheet-Board, a new solid lumber sheathing manufactured in paper-faced panels by several Western pine sawmills. This was 46% less labor time than required for plywood or fiberboard. One reason ascribed was that Sheet-Board in panels two feet wide is easier to handle than the 4-foot wide panels of other sheathing materials.

Write No. 475 on Inquiry Card—Page 34

Careful And Costly Control Grooms

# SANDVIK SPRING STEELS FOR SPECIAL PERFORMANCE



Sandvik spends extra time, money and effort to produce spring steels with the quality to meet difficult performance demands.

From the ore in Sandvik's mines to the finished strip, Sandvik applies constant, rigid quality control to every steel-making step. Special analyses, careful, small-lot processing, modern laboratories equipped with special scientific instruments...these are behind Sandvik's record of success in tough spring steel applications.

For special physical properties plus accurate and uniform flatness, straightness, width, gauge and edge finish, specify Sandvik. Wide variety of qualities and sizes in stock plus local Sandvik facilities for custom-processing and finishing to your requirements. Send for free brochure.

## SANDVIK STEEL, INC.

1702 Nevins Road, Fair Lawn, N. J.

Tel. SWarthmore 7-4200 • In N. Y. C. Algonquin 5-2200  
Branch Offices: Cleveland • Detroit • Chicago • Los Angeles  
SANDVIK CANADIAN LTD. P.O. Drawer 1335, Ste. O. Montreal 9, P. Q.  
Works: Sandviken, Sweden



For More Information Write No. 320 on Inquiry Card—Page 34

MAY 23, 1960



Checking the flatness of hardened strip steel.



Sandvik laboratories carry out over 200,000 chemical analyses a year.

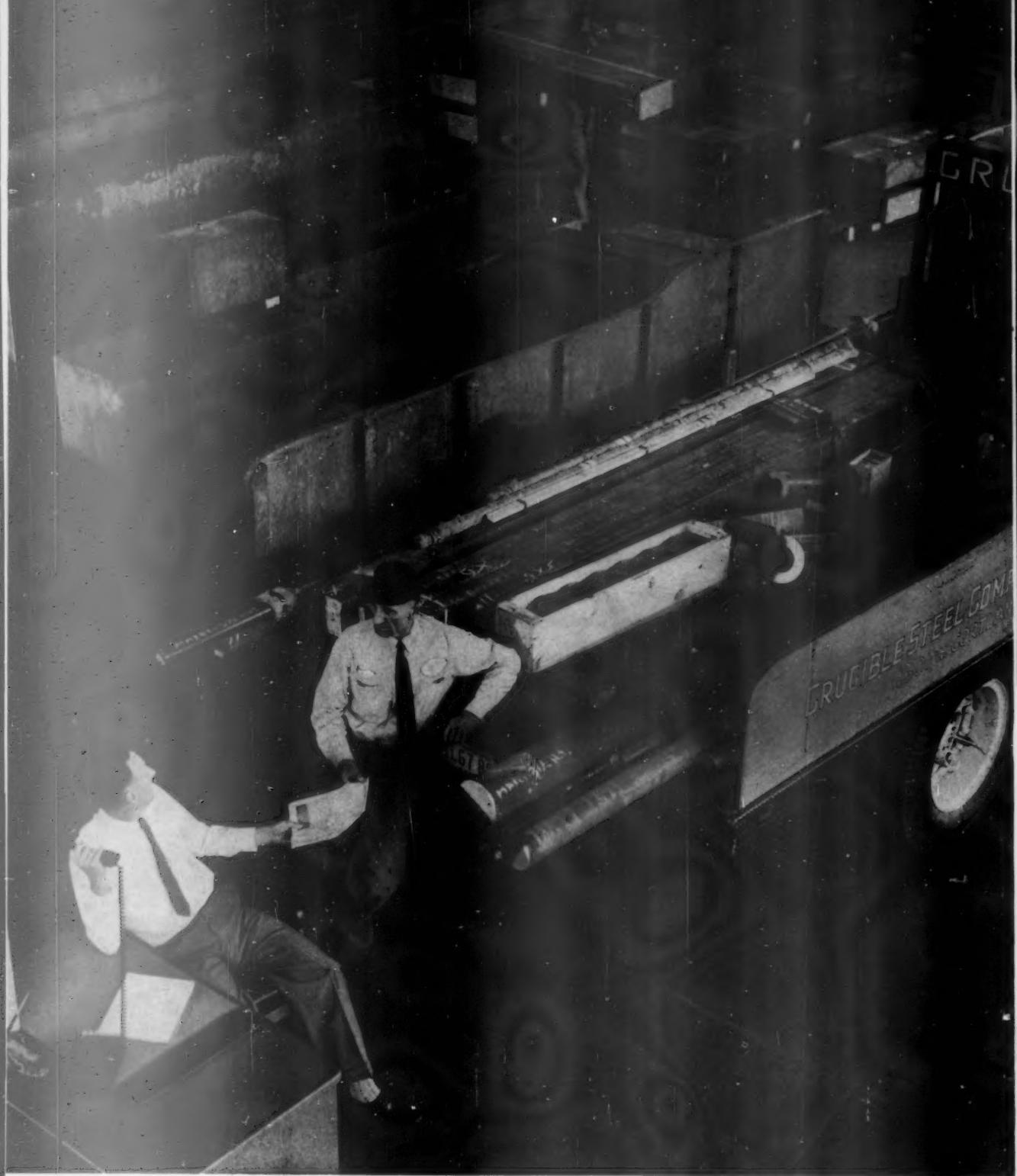


Strip thickness is checked during rolling and at final inspection with a "Deltameter".

BB-208

For More Information about ad on following page Write No. 321 on Inquiry Card—pg. 34-255

# integrated CRUCIBLE steel service



Orders for specialty steels go out fast — usually overnight or even earlier — from local Crucible warehouses.

That's because each warehouse has a wide variety of grades and sizes on hand, at all times.

# gives you local stocks of 16,000 specialty steel items for immediate delivery

Within minutes, the Crucible inside account salesman can tell you if the grades, sizes and quantities you need are available. He'll check his customer's master file for your delivery requirements, billing details, etc. And then he'll quickly arrange for cutting to meet customer's requirements. So deliveries are swift and sure.

This combination of large local stocks and warehouse efficiency means you can fill even the most varied or unusual requisitions for specialty steels with a single phone call.

It's a basic reason why purchasing agents who depend on local sources call Crucible first — like this one:

"We're basically a tool and die 'job' shop. We never know what steel we'll be using from one day to the next. So whatever we need, we need fast. It has been our experience that it saves time to call the Crucible warehouse first."

Why not simplify and speed up your specialty steel purchases by relying on your local Crucible warehouse? The advantages of Crucible's entire integrated operation, from mining the ore to steelmaking and warehouse delivery, are all available through the nearby source. *Crucible Steel Company of America, Dept. PE13, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

#### STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source  
For All  
These Steels



Local warehouse can fill both large and small orders from stocks like these of hollow tool steel sections and solid rounds.



Die casting die steels and plastic mold steels stand ready for cutting to order and immediate delivery.



Most Crucible warehouses stock stainless bars — stack them upright in "A" racks to protect the surfaces.



Need stainless sheet? The local warehouse stocks most types, finishes and sizes for prompt delivery to you.

**CRUCIBLE**

**STEEL COMPANY OF AMERICA**

*— and many others*

they turn in top performance to turn out top results

improved grinding action and longer wheel life

for faster weld grinding... **SIMONDS NEW SERIES 60**



Reinforced Resinoid  
DEPRESSED CENTER WHEELS

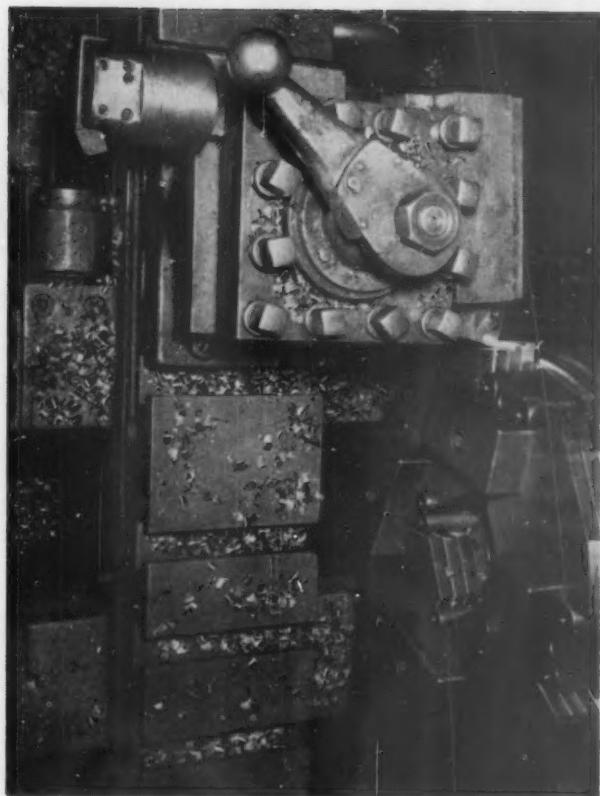
Better than ever for long wheel life . . . faster by far for economical weld grinding. This efficiency is yours with Simonds Series 60 Double XX Wheels. New manufacturing methods give this new series of reinforced resinoid bonded wheels superior grinding action. Each wheel has maximum amount of abrasive grain. Doubly reinforced for extra strength and safety. Lightweight rigid type for general use. Unexcelled for grinding welds. You can also get slightly flexible Fibrex Wheels for lighter jobs and stainless steel. Order from your Simonds distributor.

Send for Bulletin ESA 244



WEST COAST PLANT: EL MONTE, CALIF.—BRANCHES: CHICAGO • DETROIT • LOS ANGELES • PHILADELPHIA • PORTLAND, ORE. • SAN FRANCISCO  
SHREVEPORT — IN CANADA: GRINDING WHEELS DIVISION, SIMONDS CANADA SAW CO., LTD., BROCKVILLE, ONTARIO • ABRASIVE PLANT, ARVIDA, QUEBEC

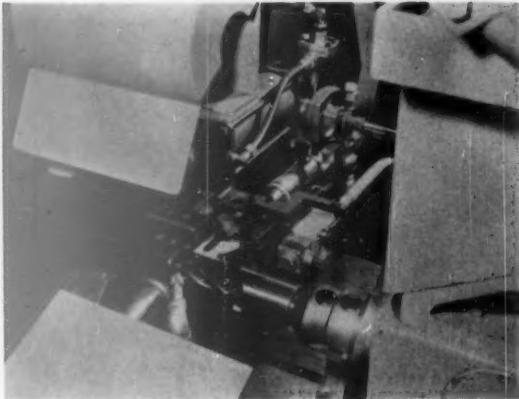
For More Information Write No. 322 on Inquiry Card—Page 34



# W Production Tools A

**V**  
VALUE ANALYSIS  
**A**

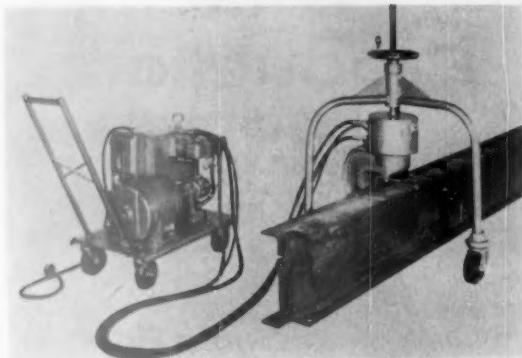
## Production Tools



### New Machining Process on Air Filters Saves \$16,000 a Year

A production bottleneck at American Air Filter has been eliminated for a saving of \$16,000 a year. Unit from Morse Twist Drill & Machine Co. machines mandrel ends eleven times faster than process requiring turret lathes, at a 91% saving. Specially designed tool reams, bores and faces both ends of mandrel simultaneously and automatically.

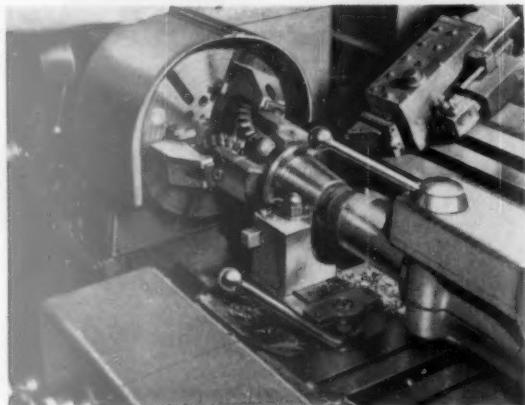
**WRITE NO. 323 ON INQUIRY CARD—PAGE 34**



### Portable, 90-Ton Hydraulic "On-the-Spot" Punch Saves Money

G. E.'s Industrial Heating Division wanted a method of hole-forming in large structural steel furnace frames which would eliminate awkward material handling, costly drilling and reduce cycle time. A Whitney 90-ton portable hydraulic punch did all three. By replacing slow drilling process with fast punching operation, job time was cut drastically and savings of 62 cents per hole achieved in frames which have a total of 1800 holes each.

**WRITE NO. 324 ON INQUIRY CARD—PAGE 34**



### Threading Lathe Replaces Four Manual Machines

Globe Oil Tools Co., Los Nietos, Calif., simplified threading and achieved dramatic cost reductions using a Gisholt Cri-Dan E threading lathe to produce tapered pin end threads on oil well rock bit assemblies. The threading lathe replaced four manual lathes and produced threads in 28 Rockwell C steel forgings 580% faster. Operator has time to handle another automatic for extra savings.

**WRITE NO. 325 ON INQUIRY CARD—PAGE 34**

For More Information about ad on facing page  
Write No. 326 on Inquiry Card—page 34→  
**PURCHASING**

## Drunken Helix Apprehended Electronically!

What is Drunken Helix? In screw threads it is the deviation in the true path of the thread spiral or helix.

This enemy to thread accuracy, this thief of product tolerances, has long been under surveillance by precision gage-makers. But no practical method has been known for quickly taking its measurement.

Now, GREENFIELD announces an all electronic detective which not only determines the presence of helix drunkenness but also makes a tape recording of it! Now we can tell the exact amount (.000020" resolution) and the exact location of drunkenness with a permanent record for reference!

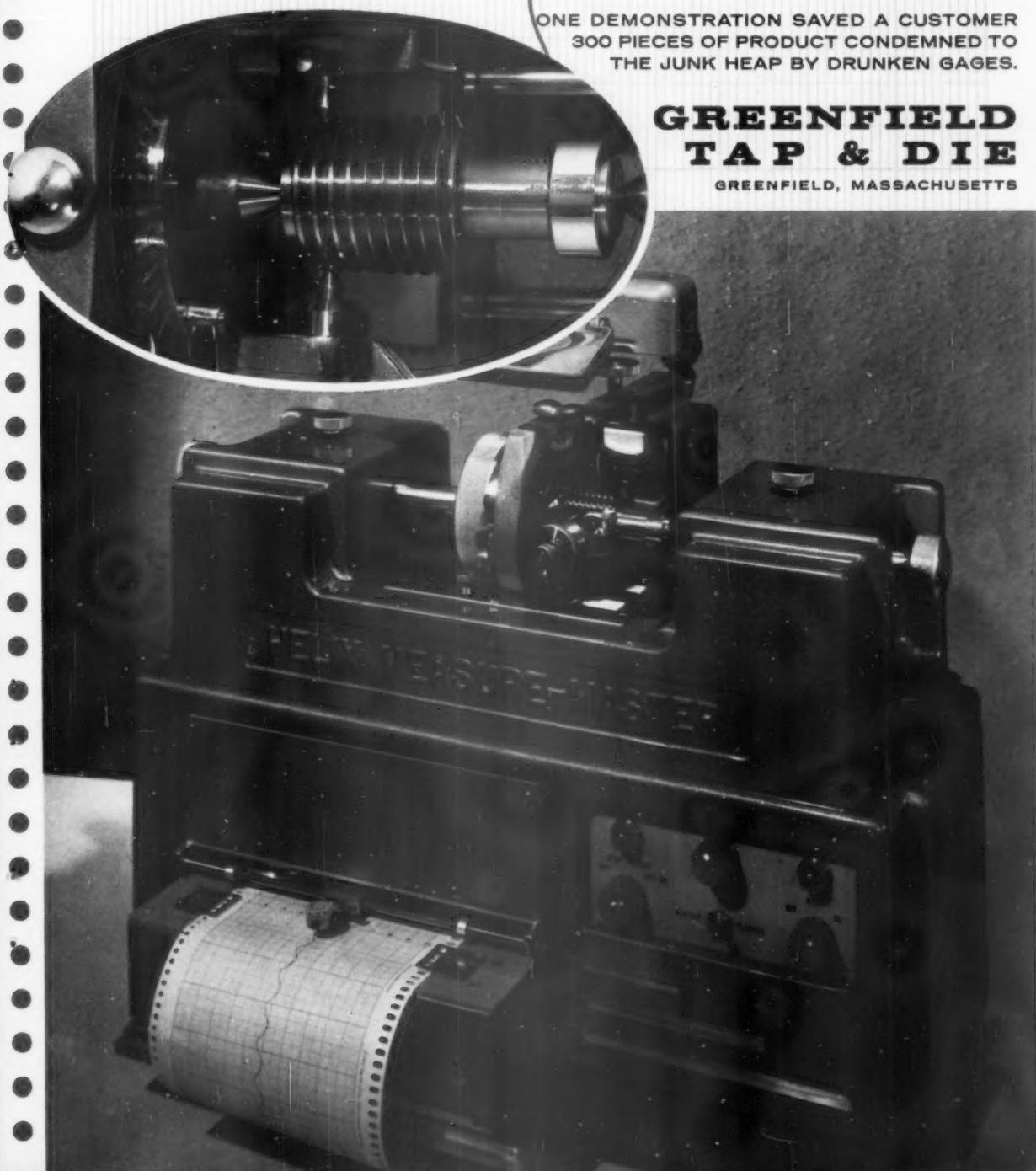
Driving probe may be shifted through 90° quadrant to measure drunkenness occurring at other than 180° span. Includes facilities for isolating eccentricity, ovality and other P.D. errors, from drunkenness.

May we send a GREENFIELD gage expert to explain the capabilities of this amazing device?

ONE DEMONSTRATION SAVED A CUSTOMER  
300 PIECES OF PRODUCT CONDEMNED TO  
THE JUNK HEAP BY DRUNKEN GAGES.

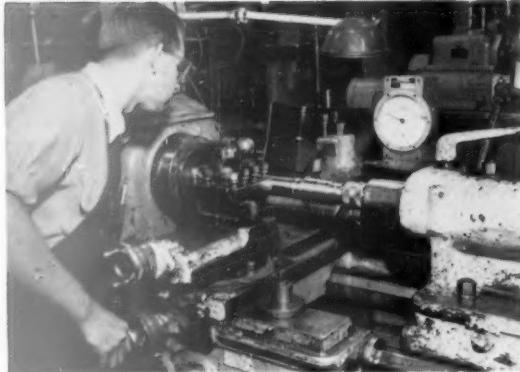
**GREENFIELD  
TAP & DIE**

GREENFIELD, MASSACHUSETTS



**V**  
VALUE ANALYSIS  
**A**

## Production Tools



### Lathe Tool Spotting Instrument Reduces Production Time 27%

The turning of multiple diameter shafts at a major automotive plant is simplified by using a Distometer manufactured by the Federal Products Corp. Instrument makes it possible to locate steps and grooves required on shaft quickly and accurately. Production has increased 27% on lathes equipped with Distometers over lathes using conventional methods.

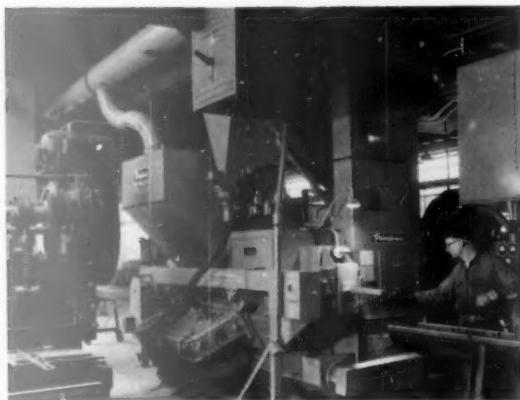
Write No. 327 on Inquiry Card—Page 34



### Substantial Savings in Toolroom Grinding Operations

Users report satisfaction after switching to Cincinnati 4A grain grinding wheels. Many jobs commonly performed with premium priced wheels can be done equally well, and in some cases better, with 4A grain. Cost of 4A wheels is 15% less, and savings in toolroom grinding operations are substantial, with no loss in grinding performance.

Write No. 328 on Inquiry Card—Page 34



### Mechanical Descaling of Bar Stock Saves \$75 Daily

Blast descaling of hot rolled steel bars for use in production of industrial safety grating saves more than \$75 a day for Bustin Steel Products of Dover, N.J. Rotoblast descaling equipment from the Pangborn Corp. eliminates need to purchase pickled bar stock. Process provides additional advantages by eliminating degreasing, permitting high speed serrating without use of oil, and providing better weld with less heat.

Write No. 329 on Inquiry Card—Page 34

# LENOX ANNOUNCES MAJOR BAND SAW BLADE ADVANCEMENT!

**The Lenox Master-Band triples the square inches of cutting per blade. Its positive cutting life is guaranteed to be at least three times longer than regular bands. A faster cutting rate is immediately visible. New cutting accomplishments can be made with standard band saw machine equipment. SEE COUPON BELOW for Guaranteed Trial Offer.**

We are extremely confident of our new Lenox Master-Band. We will guarantee that this advancement in metal cutting band saw blades will definitely put new life and more versatility into your standard band saw machine. The Master-Band will cut at a 50% faster rate than a regular band saw blade. The Master-Band will cut more square inches of metal and we guarantee that it will outlast at least three regular metal cutting bands. In addition, many of the tougher alloy steels which previously could not be cut with a regular band saw blade, can now be cut on your standard equipment with the new Master-Band.

The Lenox Master-Band is a special alloy steel band saw blade designed and engineered especially for use on conventional, horizontal and vertical metal cutting band saw machines such as the Kalamazoo, Johnson, Wells, DoAll, Marvel, Grob, Laidlaw, and others.

**THE MASTER-BAND IS SUPERIOR!**  
The special steel analysis of this new blade results in a greater quantity of carbides in the structure and when processed through the Lenox modern,

skillful heat-treating, we produce a band saw blade of proven superiority. The Master-Band assures superior resistance to wear, highly extended fatigue resistance, and assures continuous cutting of tougher steels at faster rates.



The Lenox True-Weld process, which is performed with exceptionally precisioned, fully automatic equipment, guarantees the almost total elimination of weld breakage. Specially designed welding equipment is necessary for welding the Lenox Master-Band. Each blade is perfectly matched and electrically butt welded and inspected to assure integrated bonding. Each weld is precision ground and inspected to prevent hollowing.

**COST ADVANTAGES:** More pieces can now be cut in the same time period because the Master-Band cuts at a

faster rate. Expensive down-time for at least three blade changes can now be eliminated. Tougher steels that had to be cut by other, more expensive cut-off methods, can now be cut on your standard band saw machine with the Master-Band.



**WRITE TODAY FOR MORE INFORMATION!** Want more information on increasing blade life and decreasing cutting costs? Contact your industrial distributor or write outlining your particular cutting operation. Specify materials and sizes most often cut. Also, indicate the make and model of your band saw machine. Your inquiry will be promptly and carefully answered.

## GUARANTEED TRIAL OFFER



## AMERICAN SAW & MFG. CO. SPRINGFIELD, MASSACHUSETTS, U. S. A.

PLEASE FURNISH ALL INFORMATION REQUESTED,  
COMPANY.....

(type or print)

ADDRESS.....

(street & no.)

..... city ..... zone ..... state .....

IMPORTANT! PLEASE COMPLETE  
MATERIALS AND SIZES CUT MOST.....

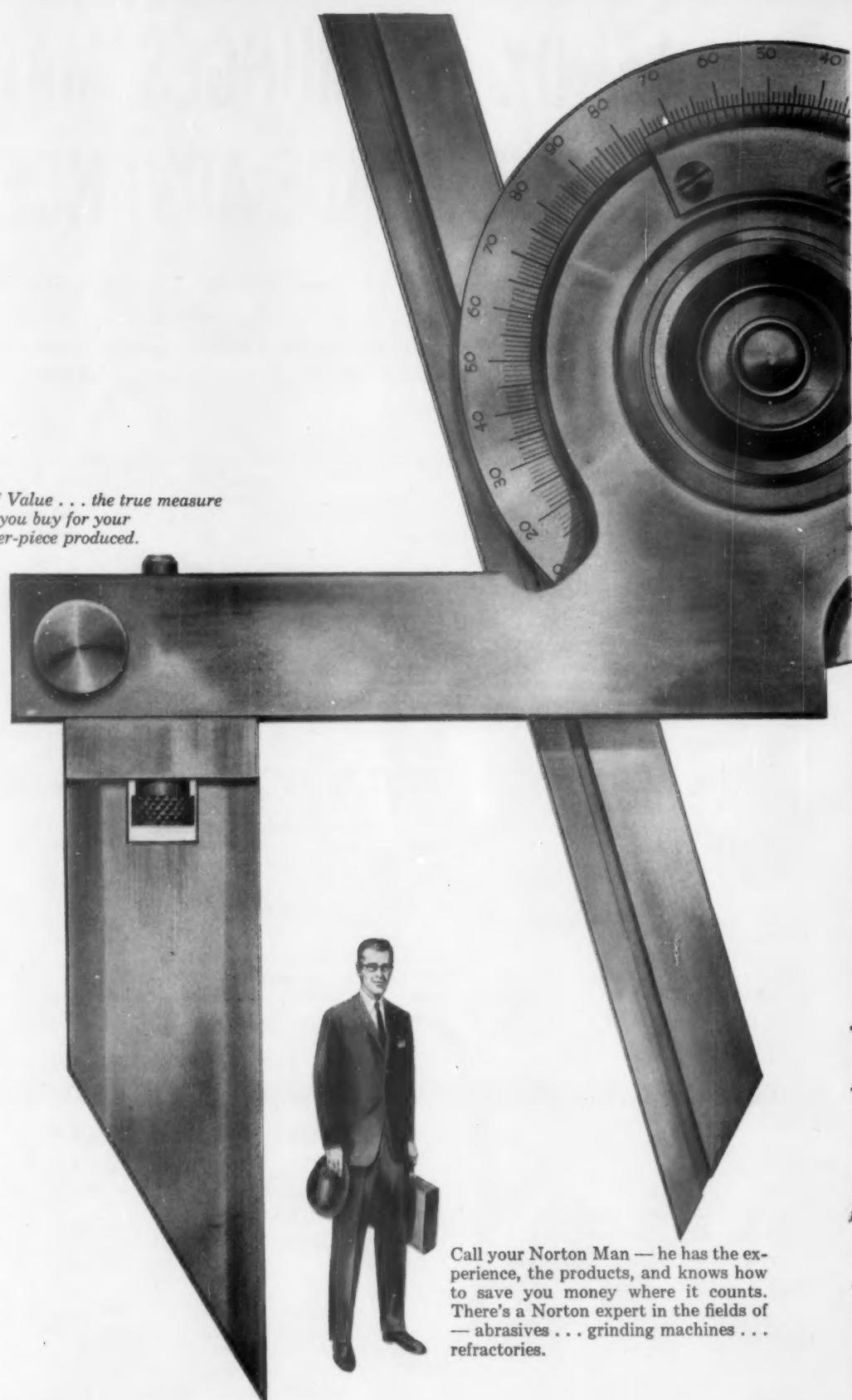
MAKE AND MODEL MACHINE.....  
INDUSTRIAL DISTRIBUTOR.....

For More Information Write No. 330 on Inquiry Card—Page 34

MAY 23, 1960

263

*The Norton Measure of Value . . . the true measure  
of savings on materials you buy for your  
production is the cost-per-piece produced.*



Call your Norton Man — he has the experience, the products, and knows how to save you money where it counts. There's a Norton expert in the fields of — abrasives . . . grinding machines . . . refractories.



# You can produce greater savings than you can buy

It is not how much you spend, but what you receive for your money that determines a bargain.

The economic truth of the above statement applies to all manufacturing and is especially true in grinding wheels.

There are cheaper grinding wheels than Norton wheels — and on the invoice they may look like a bargain. But if the wheels purchased fail to perform efficiently on the production line or incur production delays because of poor quality or misapplication — a higher cost of production is the price actually paid.

In brief, *the true measure of grinding wheel value is not how much you paid for it — but how much you get from it. Here is what you can get from Norton —*

Norton Company gives you the most advanced research engineering and manufacturing facilities in the entire abrasive field — and you get this great scope of detailed knowledge on a personal basis — your Norton Man.

Your Norton Man starts his career by spending a minimum of one year in a carefully planned training course in the Norton plant and a comparable period of training in the field. The Norton Man has an average of 15 years' abrasive experience in addi-

tion to the specialized training. He is the most knowledgeable man in abrasives that you can consult. He is your consulting abrasive engineer.

He will make a free Abrasive Requirement Study for you. This study lists the correct specifications for each abrasive job in your plant to assure you lowest cost-per-piece produced. He is also available for complete field testing on specific problems.

For example, your Norton Man can increase production by pointing out ways to better wheel usage and fewer wheel changes. He has the widest selection of grinding wheels in the industry to help him select the perfect wheel for new product grinding operations and improving your current grinding jobs — both at the lowest cost.

Norton economy pays off in lower cost-per-piece produced. Call your Norton Man. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

W-1973

**NORTON**  
ABRASIVES

**75 years of... Making better products...to make your products better**

For More Information Write No. 331 on Inquiry Card—Page 34

Sawing mild steel  
at 15 sq. in. per min.  
—thanks to POWER-CUT  
No. 360.

No. 240  
Cutting Oil gets  
results—precision  
25% greater than  
OEM specs on this  
SAE 4340 steel.

With Kleen-Kool  
a micro-finish  
of 5 RMS is  
routine.

Tool Saver alleviates  
chip packing and  
firing up in flutes  
when drilling  
aluminum.

O-1



This is a  
typical DoALL Store

The **DoALL** Company, Des Plaines, Illinois



Band  
Saws



Surface Grinders



Power Saws

MACHINE TOOLS



DoALL  
SAW BANDS



CUTTING TOOLS



DoALL  
BAND BLOCKS



DoALL  
GRANITE PLATES



DoALL  
SHOP SUPPLIES

Call Your DoALL Sales-Service Store



Your local DoALL store stocks these and other  
specially formulated cutting fluids for many  
purposes. Call your local DoALL sales-service  
representative for complete information—or  
write today for new literature, Form No. 60-4.

## Production Tools

VALUE ANALYSIS

A

### Speedy, High-Accuracy Wet Sander Saves Time, Speeds Production

A high-speed vertical wet sander is giving Synthane Corp. of Oaks, Pa., rapid production, increased accuracy and important time savings in production of industrial laminated plastic parts. Sunstrand-Engelberg wet abrasive belt grinder is designed for mass production operations, meeting varying requirements with belts of suitable grit sizes. Dimensional tolerances held to .001 in. or less are not unusual.

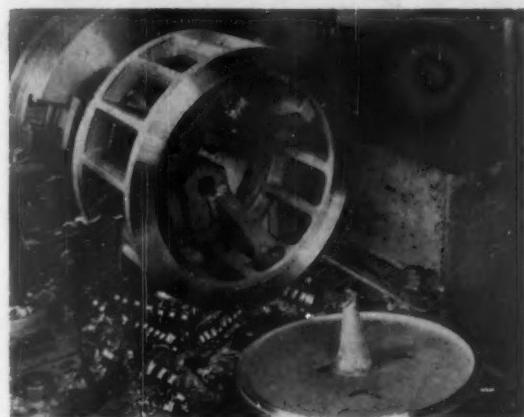
WRITE NO. 333 ON INQUIRY CARD—PAGE 34



### Downholding Lathe Chuck Top Jaws Cut Noise, Save Time, Reduce Costs

The Fischer Casting Co. faced a problem: how to cut core and face both ends parallel of ribbed nickel bronze bearing cage. Conventional chucking and attempts to cut and face one end at a time produced unbearable noise, chatter, unsatisfactory surface finish and non-parallelism. The solution: J & S Tool Co.'s adjustable downholding top jaws with support spokes were mounted on lathe chuck. Problems were eliminated, and 24 or more parts per hour are now produced as compared to 10 or less before. Daily saving \$40.

WRITE NO. 334 ON INQUIRY CARD—PAGE 34



### Better Countersinks Save on Tools, Increase and Improve Production

A boat manufacturer who had to countersink punched holes in 18-8 stainless steel found it necessary to replace countersinks frequently and was dissatisfied with hole finish. A switch to Cleveland "New Style" countersinks produced true, burr-free holes and an average of more than 6000 holes per tool. Today his tool costs are less, production is up and the product is improved.

WRITE NO. 335 ON INQUIRY CARD—PAGE 34

For More Information about ad on facing page  
←Write No. 332 on Inquiry Card—page 34

MAY 23, 1960



## Production Tools



### Extra-Large Tungsten Carbide Boring Bar Saves \$10,700 on Gun Chambers

A 64½ in. tungsten carbide boring bar saved \$10,700 in machine operations on the first 100 powder chambers of a 120 mm. gun tube at the Watervliet Arsenal. Bar weighs nearly 500 lbs. and is believed to be largest boring bar ever made of tungsten carbide. It was manufactured by Kennametal Inc. of Latrobe, Pa. when steel bars with carbide strips proved inadequate because of size of job.

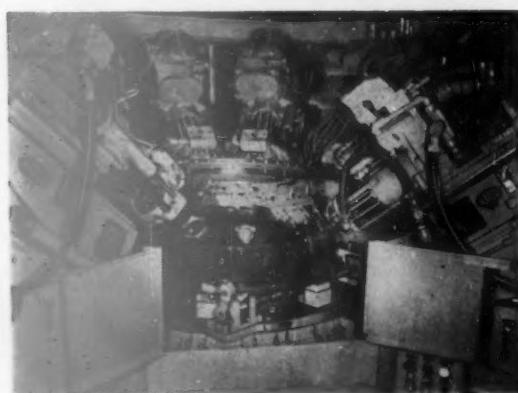
Write No. 336 on Inquiry Card—Page 34



### Standard Drill Press Substitutes for More Costly Milling Machine

At the Rockwell Mfg. Co.'s Russelville, Ky. aluminum die casting foundry, a standard 17 in. Delta drill press mills the face of a 2 in. hole in meter housings faster and at lower cost than a milling machine. Use of low-cost Delta machine prevents tying up of expensive milling machine. Easily removed pipe fitted around spindle guards against flying chips.

Write No. 337 on Inquiry Card—Page 34



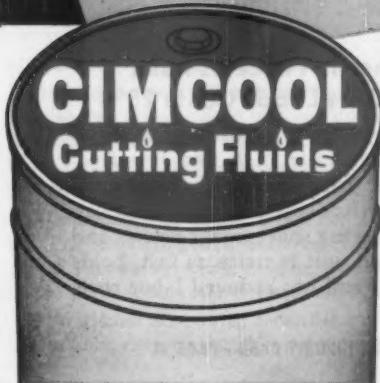
### Savings of \$270,000 with Special Index Machine

At Ford's Aircraft Division in Chicago, three methods were studied for carrying out 92 drilling, reaming and tapping operations. Method "A" involved standard machines and simple tooling. Method "B" added more costly indexing features. Method "C" was based on special automatic index machine built by National Automatic Tool Co., Inc. Estimated savings with Natco machine were \$270,000 over "A" method and \$149,000 over "B", with a saving of 528 sq. ft. of floor space in each case.

Write No. 338 on Inquiry Card—Page 34

# Heavy-Duty Improvement!

New chemical cutting fluid CIMPERIAL scores another success as a replacement to a cutting oil, in a heavy duty application.  
(Company name on request)



## FOR 100% OF ALL METAL CUTTING JOBS

Production-proved products of The Cincinnati Milling Machine Co.

CIMCOOL S2 Concentrate — The pink fluid which covers 85% of all metal cutting jobs.

CIMPERIAL® — Newest in the famous, industry-proven line of CIMCOOL® Cutting Fluids.

CIMPLUS — The transparent grinding fluid which provides exceptional rust control.

CIMCUT Concentrates (AA, NC, SS) — For every job requiring an oil-base cutting fluid.

ALSO — CIMCOOL Tapping Compound — CIMCOOL Bactericide — CIMCOOL Machine Cleaner.

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor. Or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

\*Trade Marks Reg. U. S. Pat. Off.

For More Information Write No. 339 on Inquiry Card—Page 34

**V**  
VALUE ANALYSIS  
**A**

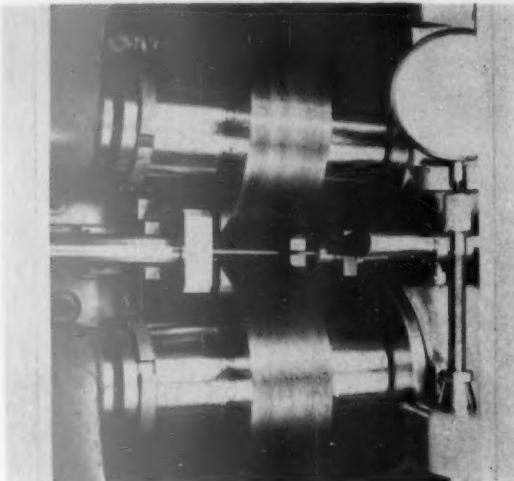
## Production Tools



### \$3500 Shearing Attachment Saves Investment of \$20,595 in Press Brake

Conversion of a hydraulic press brake into a high-production shear through use of \$3500 shearing attachment saved a \$20,595 investment in a new shear for All-American Eng. Co. of Wilmington, Delaware. Pacific Industrial attachment can be installed or removed in 15 minutes. Unit sheared 2200 quarter-inch thick manhole covers 10 in. long x 4 in. wide in 18 hours.

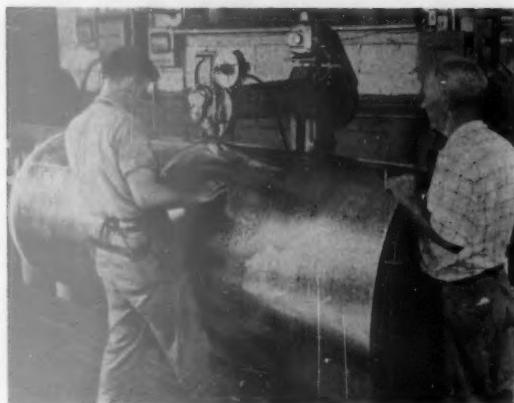
**WRITE NO. 340 ON INQUIRY CARD—PAGE 34**



### Thread Rolling and Forming Machine Improves Product, Cuts Costs

A feed screw used in Thomas A. Edison Industries' Voicewriter dictating machine had been threaded by outside vendor. Today a better product at less cost is being produced in the plant itself by use of Landis "Lanhylol" thread rolling and forming machine. Direct 57% cost savings alone justified purchase of Landis machine. Improvement in product and reduction in materials handling and transportation are added advantages.

**WRITE NO. 341 ON INQUIRY CARD—PAGE 34**

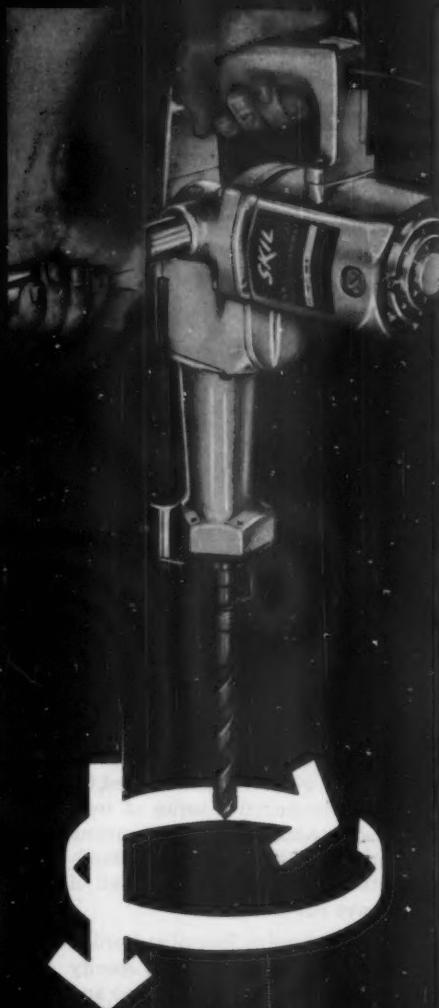


### Metal Stitcher is Twice as Fast, Holds Better, Cuts Labor Costs 25%

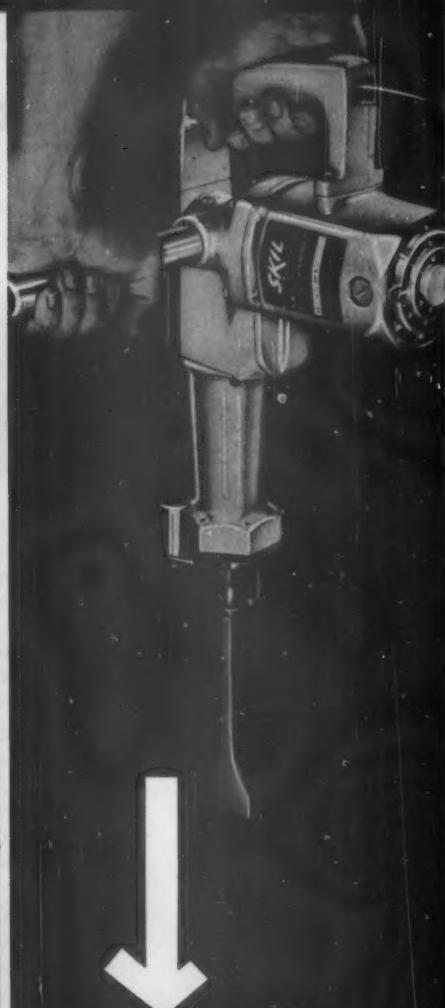
A Bostitch metal stitcher is used at Charles P. Blouin, Inc., to fabricate high and low-pressure steel metal air conditioning ducts for industrial use. Stitcher has special goose-neck arm and floor-brace. Replacing sheet metal screws and spot welding, Bostitch unit is twice as fast, holds pieces more securely and has reduced labor costs 25%.

**WRITE NO. 342 ON INQUIRY CARD—PAGE 34**

For More Information about ad on facing page  
Write No. 343 on Inquiry Card—page 34—  
**PURCHASING**



HAMMERS  
WITH AUTOMATIC  
POWER ROTATION



HAMMERS  
WITHOUT  
ROTATION



DRILLS  
WITHOUT  
HAMMERING

## New! Revolutionary Skil Roto-Hammer

Exclusive 3-way action obsoletes all other electric hammers!

It's actually 3 different tools in one:

**Powerful hammer with automatic power rotation** that drills holes in masonry up to 65 times faster than by hand . . . up to 5 times faster than ordinary hammers . . . without tiresome rotation of star drills.

**Hammer without rotary action** for all kinds of hammering jobs, including chiseling, routing, chiseling, riveting, demolition work, setting self-drilling anchors.

**Drill without hammering action** for boring holes in masonry, wood, metal, or any

material that can be drilled with standard electric drills.

Costs per hole are lowest of any hammer (see chart). Maintenance costs are lowest, too, because of unique "electro-pneumatic" drive. No springs to break . . . powerful hammering is air actuated.

Ask your Skil distributor for demonstration of Model 726 (½-1 inch) and Model 736 (1-2 inch). Or write for 8-page brochure. Skil Corporation, 5033 Elston Ave., Chicago 30, Ill. Attention: Dept. 125E.

**LOWEST COST PER HOLE**  
Based on 1000 holes (½" x 4" deep) in masonry—labor at \$3.00 per hr.

SKIL NO. 726 HAMMER	ORDINARY HAMMER
1 Carbide Bit* needed	24 Star Drills needed
19.38 hours of labor	100.4 hours of labor
\$80.14 (labor & bit)	\$337.20 (labor & bits)
8¢ per hole	34¢ per hole

\*New SKIL Carbide Bits stay sharp 20 to 30 times longer than star drills.



... and SKILSAW POWER TOOLS

## Gordon Lund



Purchasing Agent Harold Hammel discusses quality of finished cut on stainless bar stock with Bay State's Gordon Lund.

Harold Hammel is one Purchasing Agent whose interest in costs goes far beyond purchase price. As P.A. for the Sarco Company, Inc., of Bethlehem, Pennsylvania, he represents one of the largest and most successful manufacturers of components for steam power and heating installations. And, in this highly competitive field, the detailed analysis of *performance costs* is of vital importance.

To take just one of Sarco's components as an example, let's examine their Thermo-Dynamic steam trap... which is well known wherever steam is used for heating or power. Sarco conducted a series of tests designed to find the most economical method of cutting square and octagon bar stock to size for the trap. Band-saw and hack-saw cutting was compared with all of the best available abrasive cut-off wheels.

That's where Bay State Abrasive Specialist Gordon Lund came into the picture. He was asked to specify the cut-off wheel he figured would do the best job and results showed that he figured right on the button. Not only were cut-off wheels in general 15-20% more economical than sawing but Bay State's resinoid bonded wheel beat other wheels by a substantial margin in time per cut and number of cuts per wheel.

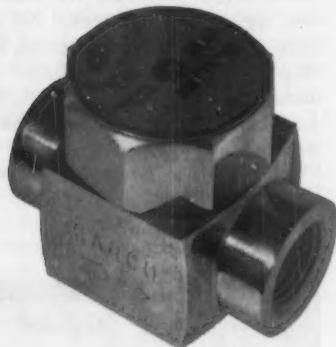
Even more important than this, after the Bay State wheels had been in use for a period of time, Sarco rated them *tops for consistency*, too... another example of the way Bay State's relentless testing procedures pay off in wheels that give the same top performance wheel after wheel after wheel.

Like Gordon Lund, your own Bay State representative brings you the advantages of wide experience with grinding problems of all types... plus a complete line of high-performance abrasive products backed by research and test programs of unequalled effectiveness. *Better grinding at lower cost... that is our business.*

Bay State resinoid bonded wheel is shown cutting 420 Series stainless bar stock to meet requirements for maximum cuts per predetermined cutting cycle. (Guard raised for photography).



**helped lower stainless cutting  
costs 15-20% at SARCO**



Four years of bare-knuckles shop experience with a major automobile manufacturer plus six years experience as an Abrasive Specialist (both in-plant and in the field) give Gordon Lund an unusually broad knowledge of the metal-working industry in general and grinding techniques in particular.

**BAY STATE  
ABRASIVES**

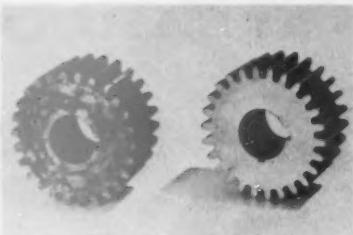


Bay State Abrasive Products Co., Westboro, Massachusetts.  
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.  
Branch Offices: Chicago, Cleveland, Detroit, Los Angeles, Pittsburgh. Distributors: All principal cities.

For More Information Write No. 344 on Inquiry Card—Page 34



**Barrel Finishing Cuts  
Gear Cost 24 cents**



In changing from hand filing to barrel finishing the cost of a gear was reduced 24 cents at the plant of a leading manufacturer. The burrs left by hobbing operations are now removed in less than two hours by using cylindrical pellets, Carbofast No. 4 supplied by the Carborundum Co., as a finishing medium in the barrel.

Write No. 443 on Inquiry Card—Page 34

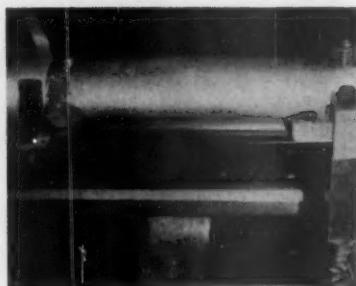
**Customer Service Lab  
Gives Profitable Answer**

The Semet-Solvay Petrochemical Division of Allied Chemical Corp. wanted a new way to make polyethylene. Product had to be in

powdered form, for which a ready-made market was waiting. For an answer Semet-Solvay went to the customer-service lab of Buflovak Equipment Division of Blaw-Knox Co. Spray-cooling technique proved highly efficient, and Buflovak equipment provided a ten-fold increase in production capacity with no increase in floor space required.

Write No. 444 on Inquiry Card—Page 34

**Production Up, Tool  
Costs Cut in Half**

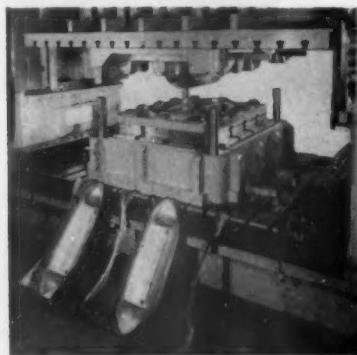


Automatic generator housings are being bored at half the former cost of tools and at increased rate

by Eicor, Oglesby, Ill. Tool costs were cut in half when brazed tip tools were replaced by Kindex tooling with Kennametal K6 cutting edges. Machining speed, feed depths of cuts and grade of carbide edge were not changed. Tool breakage problem was eliminated, as well as taper in the bore.

Write No. 445 on Inquiry Card—Page 34

**"Shimmy" Dies  
Reduce Costs 20%**



At an automotive trim plant where bumpers and parts for

For More Information Write No. 345 on Inquiry Card—Page 34

# ACCURACY ASSURED...

## CONVENTIONAL GAGES



Available in complete lines for all your applications, P&W Conventional Gages are unequalled in quality, because the skill and care that goes into making them cannot be copied. Gaging surfaces are precision lapped . . . not just ground. Expertly heat treated for superior hardness and dimensionally correct, P&W Conventional Gages insure dependable, accurate inspection plus longer wear life.



**PRATT & WHITNEY.**

FIRST CHOICE FOR ACCURACY

Buick are fabricated, engineers faced the problem of increasing production while reducing number of operations and maintaining product quality. The answer was found by extending the application of the Vulcan Tool Co.'s Brehm "shimmy" die. Use of Brehm die cut costs 20% by reducing trimming operations, reducing or eliminating gas welding and corresponding weld line trimming and cutting material handling time and number of rejects sharply.

Write No. 446 on Inquiry Card—Page 34

#### Diamond Wheels Cut Grinding Time 90%

An eastern manufacturer has reduced the time needed to complete a grinding operation on BR4 steel hardened to Rockwell C64-65 from seven hours to 35 minutes. Norton Company research on the grinding of difficult steels with diamond wheels determined grinding technique and wheel selection which led to this saving.

Write No. 447 on Inquiry Card—Page 34

#### Machining Job Cut From Six Hours to One

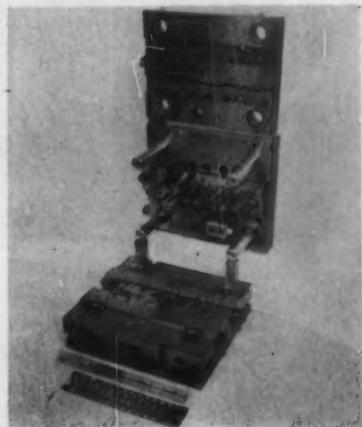


At the Fairfield Mfg. Co. of Lafayette, Ind., machining 10 $\frac{3}{4}$  in. diameter forged steel blanks used to take six hours, during which 40 lbs. of metal were removed in rough and finish turning the inside and outside diameters. Use of single-point tooling became uneconomical when increased production was required, and machining time was cut to less than one hour by designing two cat-heads each holding three

tools, and by changing type of tools from brazed carbide tip to throw-away insert tools from Kennametal.

Write No. 448 on Inquiry Card—Page 34

#### Carbide Die Outlasts Tool Steel 10 to 1



Because tungsten carbide dies give performance of about 10 to 1 in stamping, and 20 to 1 in forming.

(Please turn to page 276)

For More Information Write No. 346 on Inquiry Card—Page 34

with **PRATT & WHITNEY GAGES**

#### TRI-ROLL THREAD COMPARATORS

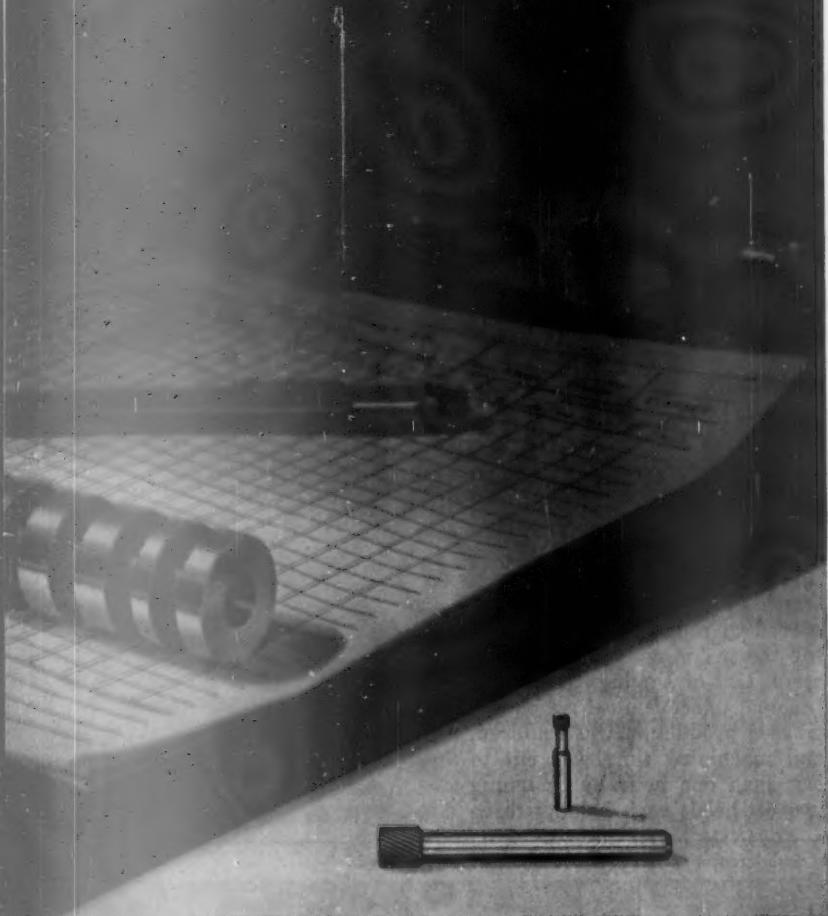
Fast and easy to operate, extremely accurate, and unusually versatile, P&W Tri-Roll Thread Comparators can be used with full-length rolls to provide a complete functional check . . . detecting errors in lead, angle, pitch diameter, and deviation from true helical path. Using interchangeable single-rib rolls, they provide a critical check of pitch diameter . . . duplicating the precise 3-wire method on a production basis!

For a complete discussion of the Tri-Roll Method for profitable control of precision threaded parts production, ask for P&W Circular No. 606.

For complete information about these and other Pratt & Whitney Gages — and for application engineering service — call your Local P&W Branch Office . . . or write direct to Pratt and Whitney Company, Inc., 19 Charter Oak Blvd., West Hartford, Connecticut.



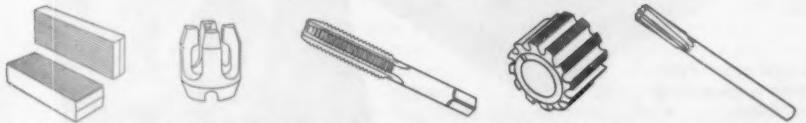
"JOB ENGINEERED" MACHINE TOOLS • GAGES • CUTTING TOOLS



## Figures Prove They Last 3 Times Longer!

When it comes to finishing small holes — down to .032" diameter — P&W Kellerflex Carbide Hole Finishing Burs have proved on job after job that they will consistently *outlast and outperform* all other finishing methods and competitive burs. On one recent job, P&W Burs lasted more than 3 times longer than the next best. On another, they delivered up to 5000 pieces per bur. In addition, P&W Burs speed up production . . . machining time is as little as 30 seconds per piece. Accuracy and finish are improved . . . work has consistently been held to .0002" for size, .00005" for roundness, and 4 micro-inches for finish! The fast-growing miniaturization market can mean BIG profits from small parts, and P&W Carbide Burs finishing small holes can help you get your share.

Write now for complete information.  
Pratt & Whitney Company, Incorporated  
19 Charter Oak Boulevard, West Hartford, Conn.



... THREAD ROLLING DIES • DUOCONE DIES • TAPS • THREAD MILLING CUTTERS • REAMERS ...



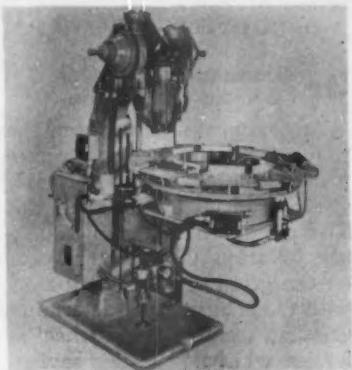
**PRATT & WHITNEY**  
FIRST CHOICE FOR ACCURACY  
MACHINE TOOLS • GAGES • CUTTING TOOLS

(Continued from page 275)

ing and drawing operations, the Chrysler Corp. is using one of the largest ever built to produce four electrical laminations at each stroke of the press. The carbide die, which in operation is subjected to 100 strokes per minute, was built by the Oberg Mfg. Co. from carbide produced by the Allegheny Ludlum Steel Corp.

Write No. 449 on Inquiry Card—Page 34

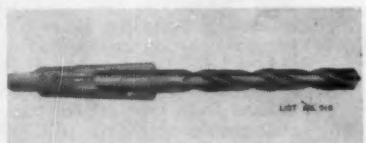
### Production Tripled With Job-Tailored Riveter



Ford Motor Co., Sandusky, Ohio, practically tripled production rate of a window gear and cam assembly through the use of a special triple-drive riveting machine equipped with an eight-station dial table. Tubular Rivet & Stud Co. designed the machine, which includes an automatic greasing mechanism to lubricate the assembly during production. Completed assemblies are automatically ejected after fastening.

Write No. 450 on Inquiry Card—Page 34

### Cobalt Drill Solves Breakage Problem



Drilling holes in two sheets at once, sometimes directly on a spot weld, caused difficulty in an automobile plant. Poor tool life and tool breakage problems were solved by changing to Cleveland cobalt high speed drills. These are now producing more than 4200 holes per grind and have eliminated breakage.

Write No. 451 on Inquiry Card—Page 34

For More Information Write No. 347  
← on Inquiry Card—Page 34



## Put yourself "on the line" when you buy coated abrasives

Whether they're grinding and blending welds, or touching up surface defects prior to finishing, these men are working hard to keep the line moving. They, and their supervisors, are directly responsible for keeping production moving . . . quality up . . . costs down. You can easily understand why *they* think the Coated Abrasives they use are important tools.

If you were one of those men with the grinders—or his supervisor—wouldn't you want to make sure you had the best available abrasive discs to help you meet your production standards?

3M Coated Abrasives can do just that. They are the finest production cutting tools of their kind on the market today. They are precision engineered and precision

made for the jobs they are to perform. They are manufactured by the world's largest maker of coated abrasive products . . . and kept *first* in new developments by 3M's own research laboratories. As far as service is concerned, 3M's nationwide organization is equipped to give your company both technical advisory service and immediate delivery of coated abrasive products in any amounts or special requirements.

Whatever purchasing yardsticks you may use, it will pay you to investigate 3M Coated Abrasives for your production line requirements. Ask your 3M Representative how he can help you meet them best, with 3M Brand. Or, write to 3M Co., St. Paul 6, Minn., Dept. LS-48. Made in U.S.A. by Minnesota Mining and Mfg. Co., St. Paul 6, Minn.



### 3M Coated Abrasives TYPE "C" DISCS

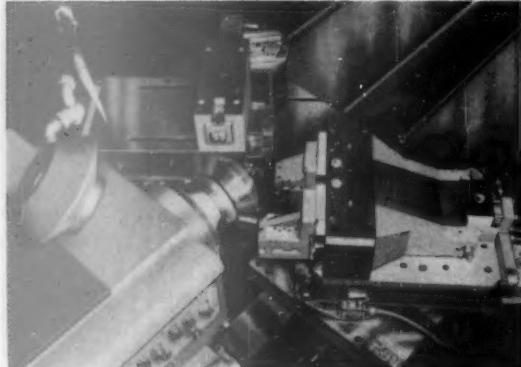
**MINNESOTA MINING AND MANUFACTURING COMPANY**  
... WHERE RESEARCH IS THE KEY TO TOMORROW



For More Information Write No. 348 on Inquiry Card—Page 34



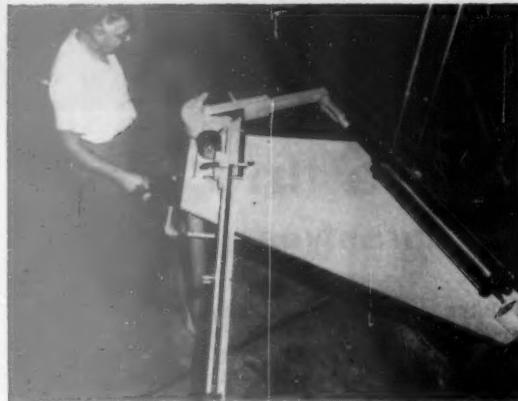
## Production Tools



### Chucking Lathe Cuts Set-up and Machine Time

At the Harnischfeger Corp., Milwaukee, Wis., a Gisholt No. 24 automatic chucking lathe handles 27 different sizes of steel bevel gear blank forgings. The 12 $\frac{3}{4}$ " diameter by 5 $\frac{1}{2}$ " wide part shown is machined in 7 $\frac{1}{2}$  minutes. Special tooling, including swivel base slides and special gages to speed angular setting, plus fast stock removal, reduce set-up time 15%, machining time 30%.

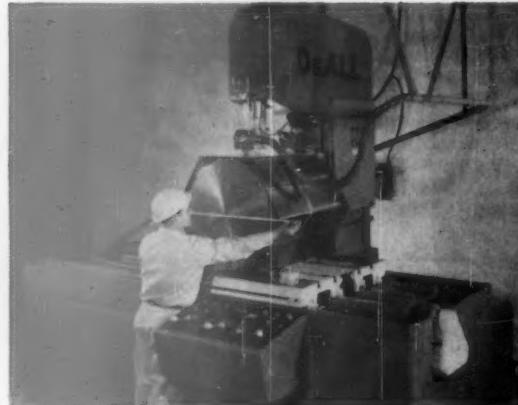
**WRITE NO. 349 ON INQUIRY CARD—PAGE 34**



### Switch to Air Control Jumps Production 40%

A metal-forming operation at Lance Awning Corp., Lake Worth, Fla., is now performed 40% faster and by one man instead of two, after installing a double-acting air cylinder made by A. Schrader's Son. Previously, two men working a hand-operated radius bender could form 25 aluminum parts per hour. Now, 35 formed parts are turned out by one man in the same time.

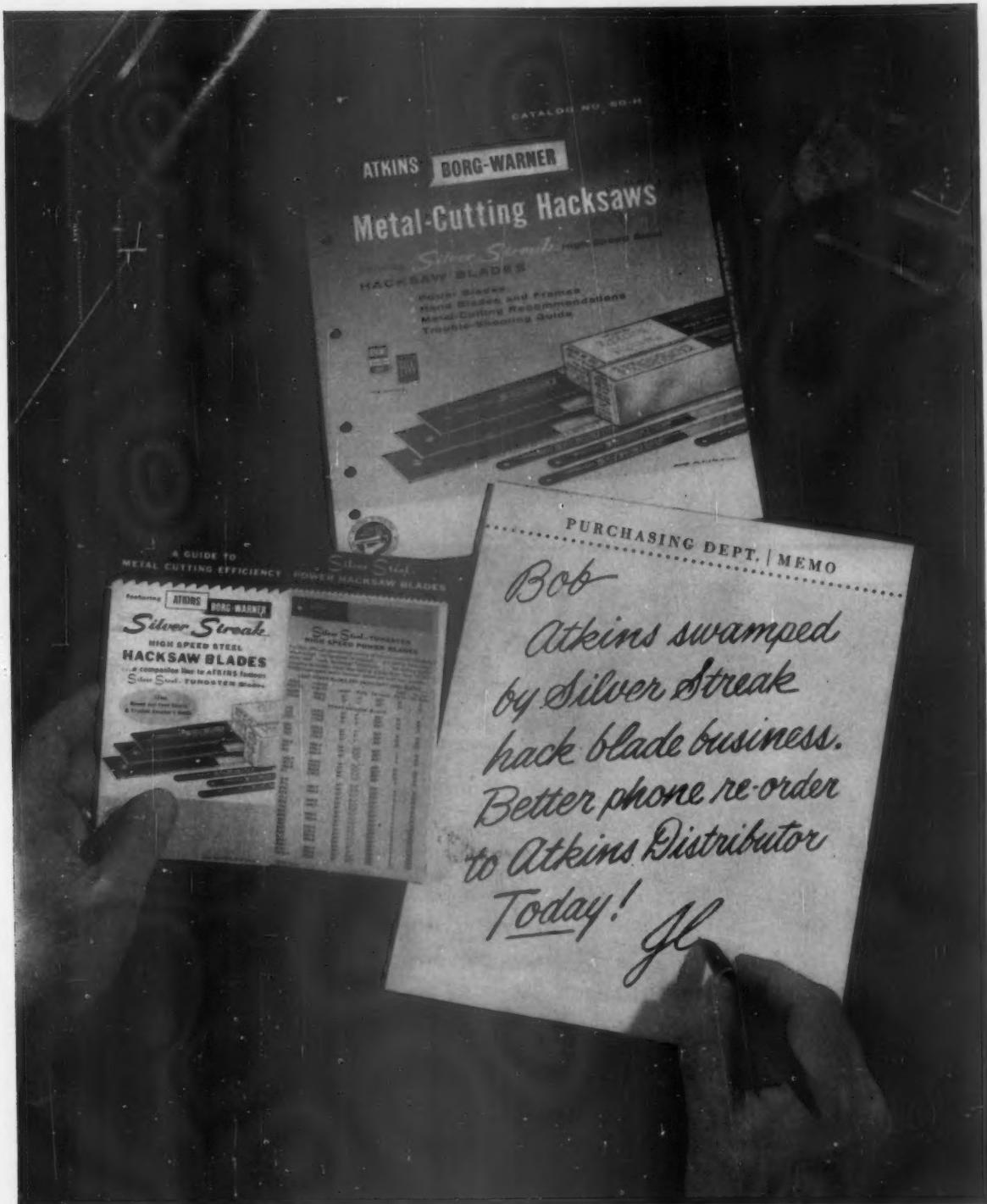
**WRITE NO. 350 ON INQUIRY CARD—PAGE 34**



### Slicing Beryllium Plates from Billet Saves \$50,000 in Machining

To make 13 hexagonal plates 30 in. in diameter and from 1 to 2 in. thick, Cleveland's Brush Beryllium Co. started with one huge 2575 lb., 36 x 36 in. billet. A DoALL band mill shaped and sliced billet into required sizes. Saving over alternate method of pressing and milling pieces individually is estimated at \$50,000 in material alone and 200 hours of furnace time.

**WRITE NO. 351 ON INQUIRY CARD—PAGE 34**



Ask your ATKINS Industrial Distributor about **Silver Streak**... greatest hacksaw blade improvement in 50 years...or, write to

ATKINS SAW DIVISION • Borg-Warner Corp., Indianapolis 25, Indiana

For More Information Write No. 352 on Inquiry Card—Page 34

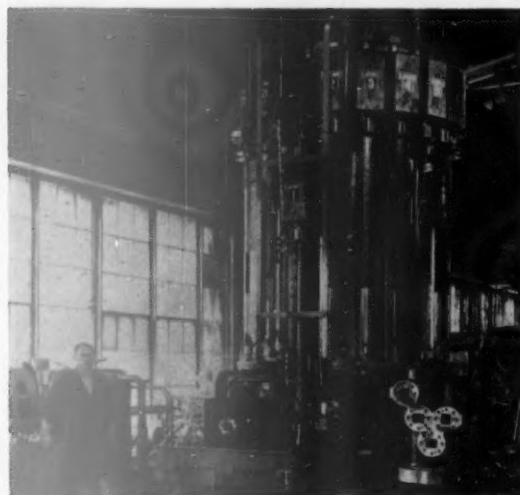
## Production Tools



### Better Quality, Lower Cost With New Nickel Plating Process

Improved appearance and reduction in finishing cost resulted when a new nickel plating process was installed at the Mansfield, Ohio, plant of the Dominion Electric Corp. The Udylite Super 66 process has reduced finishing costs up to 33% and time by 50%. A buffering process has been eliminated saving \$600 a month on buffering materials alone. Chromium is applied directly after nickel plating and process produces an exceptionally high gloss.

Write No. 353 on Inquiry Card—Page 34



### Broaching Machine Cuts Work Time from 78 Hours to 2 Hours

At the Cameron Iron Works of Houston, producing a 6-way valve used to require 13 hrs. per hole or 78 hrs. for all 6 holes. Lapointe mammoth-size pull-down broaching machine reduced the time required for 6-hole valve to 2 hrs. Cameron can now produce holes in 35 valves in time previously required for one. Unique features are turret application and design permitting dead center pull on the broach.

Write No. 354 on Inquiry Card—Page 34



### Automatic Production of 17 Brake Parts on Single Machine

A flexible machine from the Cross Company of Detroit demonstrates that automation need not be restricted to high-volume production of single part when several similar parts can be made on same machine. Unit provides a truck air-brake manufacturer with automatic production on any one of seventeen different styles of parts. Cross automatic production gives greater accuracy, and over-all production costs have been drastically reduced.

Write No. 355 on Inquiry Card—Page 34

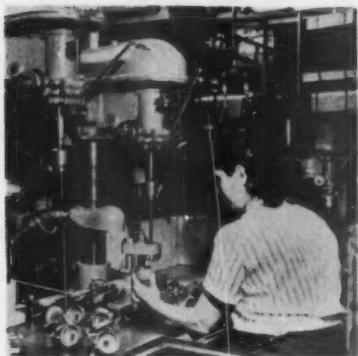
**\$25,000 Investment  
Returns \$54,000 Yearly**



A machine investment of \$25,000 returned \$54,000 in one year for the Whittaker Controls Division of Telecomputing Corp. Savings were achieved by purchase of new Heald Bore-Matic to replace old model precision turret lathe previously used. Timely replacement action by company making air and hydraulic components not only paid for machine in first year of operation but netted \$29,000 profit. Advantages not computed in dollars include finer finishes and much lower scrap losses.

Write No. 452 on Inquiry Card—Page 34

**Low Cost Drill Press  
Quadruples Output**



Using a simple Delta drill press plus a precision workholding fixture, a semi-skilled operator at the Lionel Corp. of Irvington, N. J., reams four times as many  $\frac{1}{2}$  in. holes as a skilled operator did on horizontal boring machine. Hourly output on far less expensive machine increased from 87 to 350 pieces per hour, with no loss in accuracy or increase in rejections.

Write No. 453 on Inquiry Card—Page 34

# BISCA is the **Basic File**

**for  
cutting  
metals  
and  
costs**



## **DELTA BISCA FILES**

- Have unique tooth structure designed for fast cutting
- Remove metal rapidly—yet leave smooth finish
- Last up to 40% longer than other files
- Cut Brass, Iron, Steel, Copper, Aluminum Alloys and even tough Plastics with equal efficiency
- Are available in flat, half round and square shapes

*That's why Bisca is the Basic File for you.*

**Order BISCA FILES from your**  **DELTA INDUSTRIAL DISTRIBUTOR**

**DELTA FILE WORKS, INC. • A PLUMB SUBSIDIARY • PHILADELPHIA 37, PA.**

For More Information Write No. 356 on Inquiry Card—Page 34



Manufactured by Royal Tools, Inc.

Marketed Industrially by The Bristol Company

You'll have to see this to believe it!

Here's a new end-wrench that grips and turns nuts so rounded that ordinary wrenches can't move them. Yet it gives you true, fast ratchet action that can save you up to 70% in work time.

It's WRENCHKING!, first really basic end-wrench improvement in years. Three-way gripping action clamps firmly on nuts at three points (as against two for ordinary end wrenches) and allows you to turn corner-rounded nuts that you'd ordinarily throw out or, if already installed, have to cut off. WRENCHKING's extremely simple, completely reliable ratchet-action speeds assembly and increases production on almost every job using nuts; yet the new wrench requires no more clearance than an ordinary end-wrench.

See WRENCHKING today at your Bristol Socket Screw Distributor's. You won't rest till you get a set. All popular end-wrench sizes. Or write: The Bristol Company, Socket Screw Division, 185 Bristol Road, Waterbury, Conn.

A.O.S

†Patents Pending

Precision socket screw manufacturers since 1913

Bristol's Hex Socket Screws

Bristol's Multiple-Spline Socket Screws

\*Made in sizes as small as No. 0 in Alloy Steel and Stainless Steel. Cap screws up to 1½" diameter.

**THE BRISTOL COMPANY** Socket Screw Division Waterbury 20, Conn.

See us in Booth 430 at Design Engineering Show.  
For More Information Write No. 357 on Inquiry Card—Page 34

282

### Burned Clay Grog at One-Tenth the Cost



Production at Fels Refractories of Matawan, N. J., calls for use of various burned grogs, or aggregates, in many different sizings from 6 mesh to dust. Until recently, the company had been purchasing these at costs up to \$50 a ton. Today all Fels requirements are met in their own plant at one-tenth the previous cost by means of a jaw crusher and a Stokes "Tornado" Mill—a whirling-blade granulator with a vertical flow-path and a 360-degree screen.

Write No. 454 on Inquiry Card—Page 34

### 47 Parts Precision Ground on One Machine



One Heald Model 171 Gagematic with additional equipment grinds bores of forty-seven different industrial sewing machine parts at Chicago plant of Union Special Machinery Co. Unit is equipped with 30 sets of additional fixture equipment and two high frequency heads in addition to belt driven head. Bore is ground to a tolerance of 0.0003 in. for size with a finish of 25 to 30 micro-inches rms.

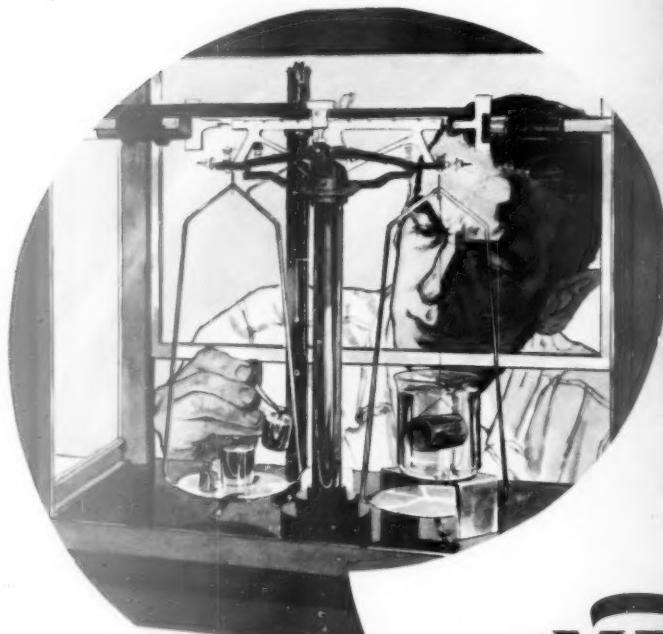
Write No. 455 on Inquiry Card—Page 34  
For More Information about ad on facing page Write No. 358 on Inquiry Card—pg. 34→ PURCHASING



*This is the new trademark of the Vascoloy-Ramet Corporation.*

This symbol stands for creative research, metallurgical knowledge, production skills, precision equipment and products of the highest quality attainable . . . all to meet the ever changing demands of industry.

CREATING THE METALS  
THAT SHAPE THE FUTURE



New metals for new  
needs through metallurgical  
research.

Years of research, experimentation and comprehensive testing have been devoted to every type of product being manufactured at V-R. By working closely with all types of industry, this metallurgical knowledge is effectively applied to meet industry's ever-changing demands for refractory metals. Whether you need better cutting tool materials . . . parts with greater resistance to heat, wear and corrosion . . . or intricate parts cast to close tolerances, then V-R research in refractory metals can be of help to you.



VASCOLOY-RAMET

CREATING THE METALS  
THAT SHAPE THE FUTURE



**Quality starts with purity**

There's no secret to producing quality products at V-R. It's a simple matter of starting with highest purity raw materials and maintaining this purity and uniformity throughout all production processes.

A good example of V-R's quality control is this X-Ray Fluorescent Spectrograph which tells the exact composition and amount of each component in the material being tested... assuring purity of raw materials and uniformity of powdered metal compositions.



**VASCOLOY-RAMET**

CREATING THE METALS  
THAT SHAPE THE FUTURE



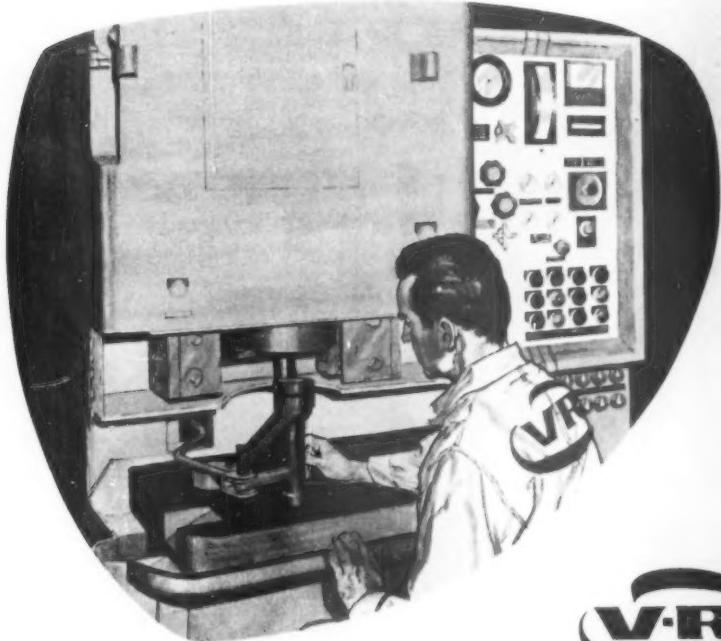
**Constant checking  
assures consistent carbide  
performance**

The consistent performance of V-R carbide is largely due to the varied and frequent quality checks at every stop of the production process. Here, we see a metallograph being used to check grain structure and absence of porosity against rigid standards. Similar checks are constantly made to assure proper hardness, density and transverse rupture strength. This elaborate checking system assures that each piece of a specific V-R grade will always perform the same.



**VASCOLOY-RAMET**

CREATING THE METALS  
THAT SHAPE THE FUTURE



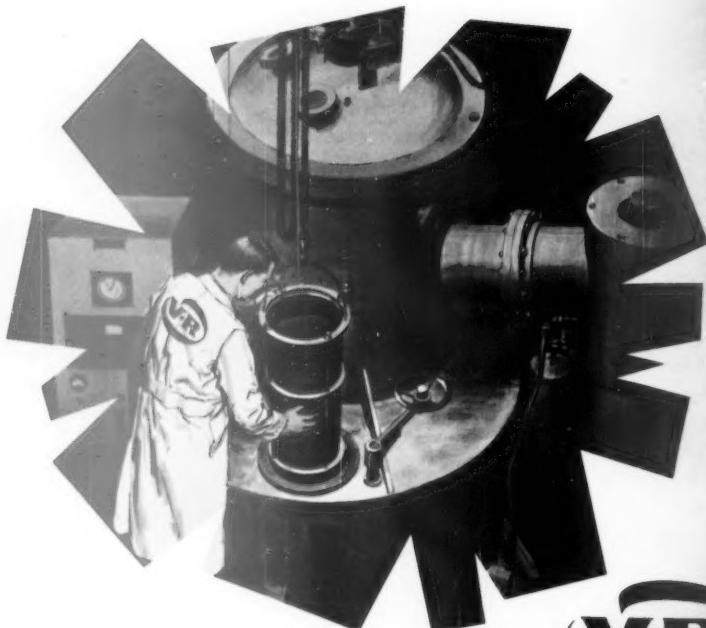
**Precision equipment assures  
accurate shapes and sizes**

No single method can produce all the sizes and shapes of products manufactured at V-R. For example, that's why five different pressing methods are used to meet industry's carbide needs. The press shown here is typical of modern accurate equipment used to compact carbide at V-R. Regardless of the method used, precision controls and the knowledge gained through long experience enable V-R to form metals to accurate dimensional requirements and proper density.



**VASCOLOY-RAMET**

CREATING THE METALS  
THAT SHAPE THE FUTURE



**V-R vacuum sintering makes  
better cemented carbides**

Vacuum sintered carbide grades are more versatile because precise control during vacuum sintering removes trace impurities . . . increasing the strength of V-R carbides and their ability to withstand cutting conditions which generate extreme heat. Vacuum sintering is one of the many reasons for the superior performance of V-R's new carbide grades for machining all types of steel and the new superalloys.

**VASCOLOY-RAMET**

CREATING THE METALS  
THAT SHAPE THE FUTURE



**Finishing to customers'  
specifications**

V-R from the first recognized industry's need for finished products ready for immediate use. People and equipment were then geared to manufacturing products to meet the varied specifications of industry. Thus, whether you use V-R metals in the form of blanks, inserts, brazed tools, wear parts, coal and rock bits or any of numerous other forms, you will find that V-R has the equipment and knowhow to fulfill your requirements.

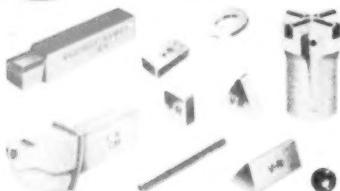




## CREATING THE METALS THAT SHAPE THE FUTURE

Metals that shape the future take many forms . . . *cutting tools* for all types of machining operations . . . *parts* designed for extreme resistance to heat, wear and corrosion . . . *mining bits* for increasing coal production . . . *percussion bits* for helping build turnpikes, dams and tunnels . . . *metals cast* to close tolerances eliminating costly machining operations . . . but, regardless of the form they take, all V-R refractory metals are playing an important role in shaping a better future.

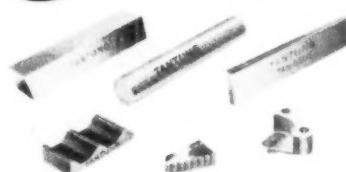
### VR CARBIDE



V-R CARBIDE is produced in a wide range of grades, each with different characteristics for specific uses. Available in all types of blanks, inserts and brazed tools for machining . . . balls, discs, rods, tubes, special shapes and parts that resist heat, wear and corrosion . . . a complete range of coal mining bits and percussion bits.

A-779

### VR TANTUNG



V-R TANTUNG is an exclusive cast alloy with high red-hardness, high transverse rupture strength, high shock resistance and low coefficient of friction. Widely used as solid tool bits, cut-off blades, cast-to-form shapes and tipped tools. Also, Tantung, because of its characteristics, is one of the more popular V-R metals used for investment casting of small, intricate parts.

### VR CERAMIC VR-97



V-R CERAMIC VR-97 is an entirely new aluminum oxide cutting material for ultra-high speed machining. It outperforms all other ceramics. Proven in continuous production, it provides a better finish, better size control and a longer tool life with speed flexibility.

### VASCOLOY-RAMET

800 MARKET STREET • WAUKEGAN, ILLINOIS

## Production Tools



### Jet Nose Cone Cost Cut From \$131 to \$15 by Explosive Forming

Manufacture of a jet aluminum nose cone by welding together five separate pieces would cost the Ryan Aeronautical Co. \$131. The use of explosive forming costs only \$15, and nose cone meets tolerance of 0.002 in. Ryan employs epoxy laminate-faced die, backed up with resilient cast epoxy in a Kirksite mold, with formulations based on Shell Chemical Co. resins.

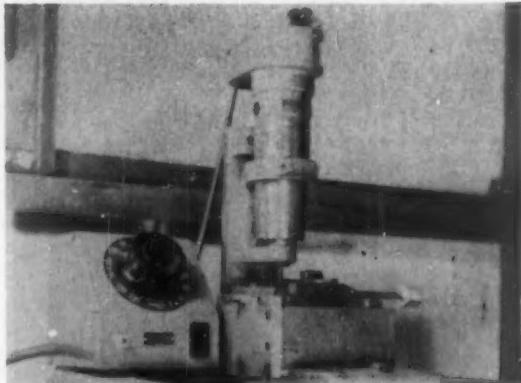
WRITE NO. 359 ON INQUIRY CARD—PAGE 34



### Assembly Time Cut 55% With Precision Milling

Milling nylon encased parts for electrical relays to close tolerances has reduced assembly time by 55%. At the Allied Control Co., Plantsville, Conn., parts are inserted between two opposed carbide end cutting mills driven by Super 50 power quills manufactured by the Precise Products Co. High speed milling results in good finishes and no run out, even though work proceeds as fast as operator can load and unload fixture.

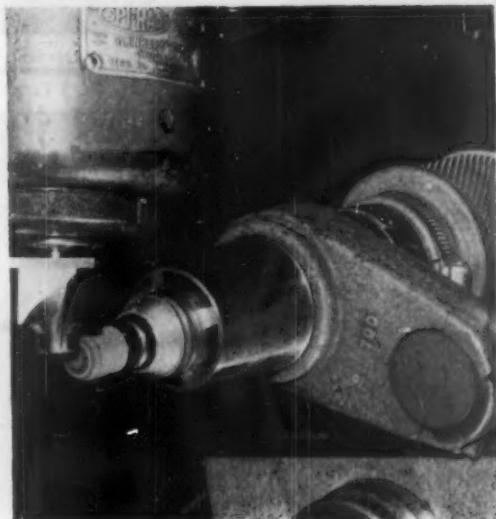
WRITE NO. 360 ON INQUIRY CARD—PAGE 34



### Power Quill Reduces Set-up Time by One-Third

The Glenbard Tool Co., Chicago, reports it has saved 1/3 of labor on set-up time for a spiral relieving operation. In addition, better finishes and closer tolerances are obtained by using a Precise Super 60 power quill. Former system used lather grinders; the power quill is mounted on a B&S #13 universal grinder with a relieving fixture. No special brackets are needed.

WRITE NO. 361 ON INQUIRY CARD—PAGE 34



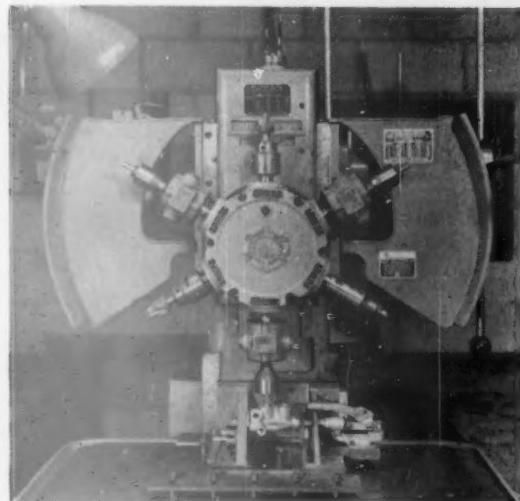
## Production Tools



### Ultrasonic Pickling Insures Clean Parts, Speeds Assembly

An ultrasonic pickling unit now cleans gas turbine engine parts in half a minute at Lycoming Division of Avco Corp., a step which formerly required 1½ hours of soaking. The double-boiler pickling installation uses equipment built by Branson Ultrasonic Corp. to remove oxides, scale, flux, and other contaminants from castings, weldments and sub-assemblies.

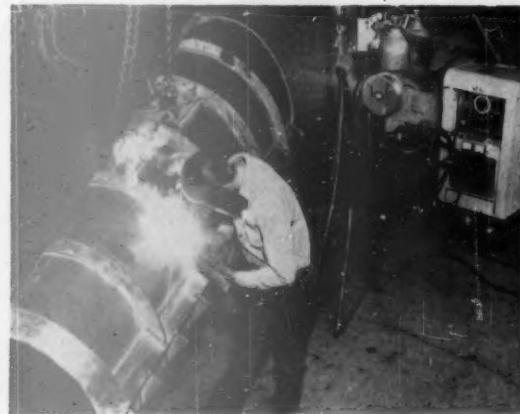
WRITE NO. 362 ON INQUIRY CARD—PAGE 34



### Six-Spindle Turret Drill Cuts Machine Time from 36 to 3-1/4 Min.

The machining time required in production of water softener valve bodies at the Schurz Controls Corp. has been cut from 36 to 3¼ minutes by use of Burgmaster six spindle turret drill. Burgmaster turret quickly indexes at operator command to bring six tools into operation at one station, eliminating waste motion and errors of relocation. Result is not only saving in time but improvement in quality.

WRITE NO. 363 ON INQUIRY CARD—PAGE 34

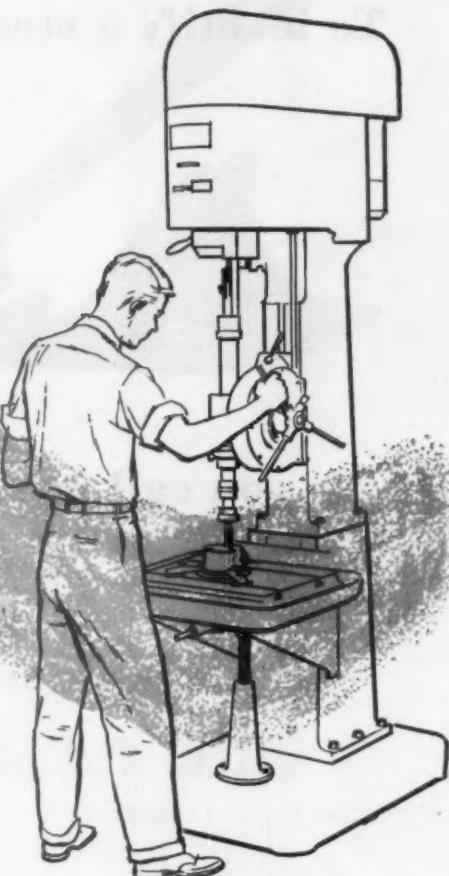
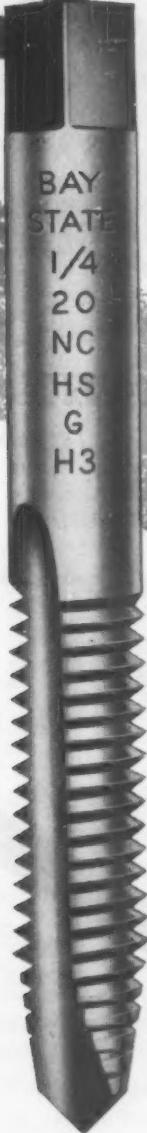


### Flux-Cored Welding Process Cuts Welding Costs by Two-Thirds

Use of flux-cored semi-automatic Dual-Shield welding process has enabled the Gledhill Road Machinery Co. to cut the welding cost on snow plow mold boards by 66%. Operation involving mild carbon steel  $\frac{5}{8}$  to  $\frac{3}{4}$  in. thick used to take 2 hrs. 50 min. Today it has been reduced by one full hour, due to higher deposition rates of unit from the National Cylinder Gas Division of Chemetron Corp.

WRITE NO. 364 ON INQUIRY CARD—PAGE 34

*A Tap on the Job  
is Worth  
Two in the Mail*



## PERFORMANCE AVAILABILITY!

YOUR BAY STATE DISTRIBUTOR HAS IT — whether you need two flute bottoming machine screw taps for threading small parts in automatic production or dryseal pipe taps for stainless steel fittings.

INFINITE QUALITY CONTROL in the manufacture of Bay State taps assures you of long run, precision performance.

8 NEW FACTORY STOCKROOMS strategically located throughout the country continuously stock your Bay State distributor to meet every tapping requirement. And — Bay State's factory trained tapping specialists work closely with distributors to assure the most efficient tapping performance for their customers.

Call your Bay State distributor and . . . YOU WON'T GET CAUGHT WITH YOUR MACHINES DOWN.



On the nearby shelves of  
your Industrial Distributor



## BAY STATE TAPS

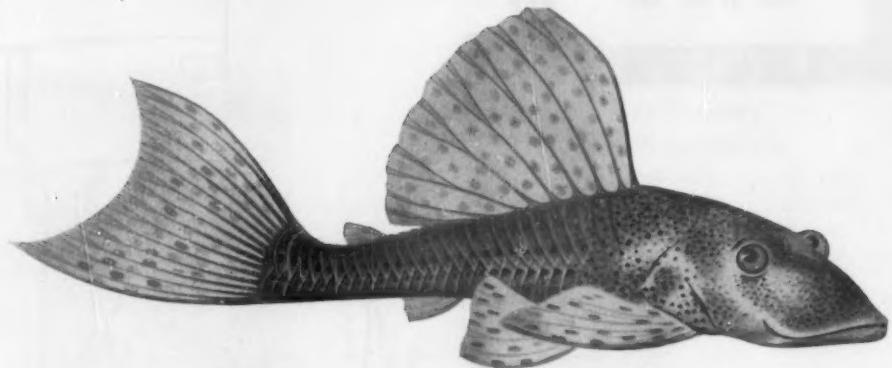
BAY STATE TAP & DIE COMPANY • MANSFIELD, MASS.

A SUBSIDIARY OF THE CLEVELAND TWIST DRILL COMPANY

Stockrooms: New York • Atlanta • Cleveland • Detroit  
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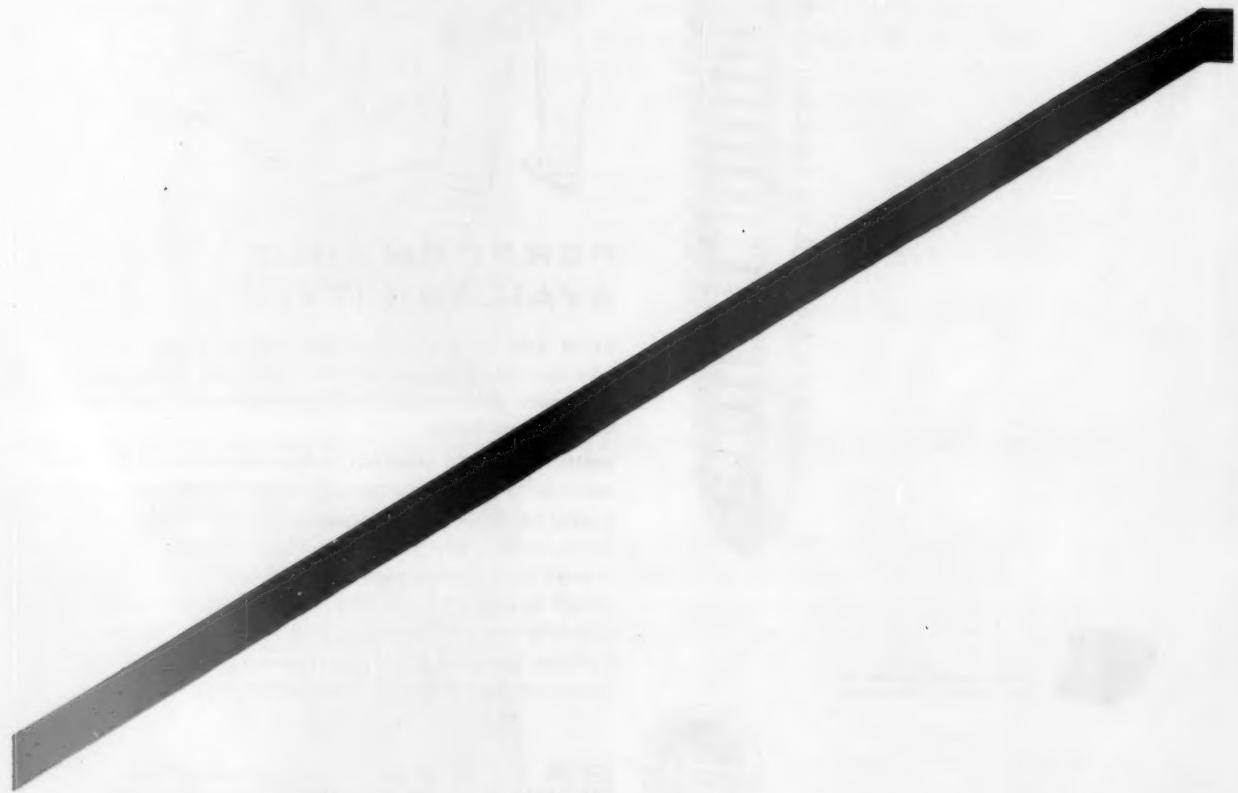
For More Information Write No. 365 on Inquiry Card—Page 34

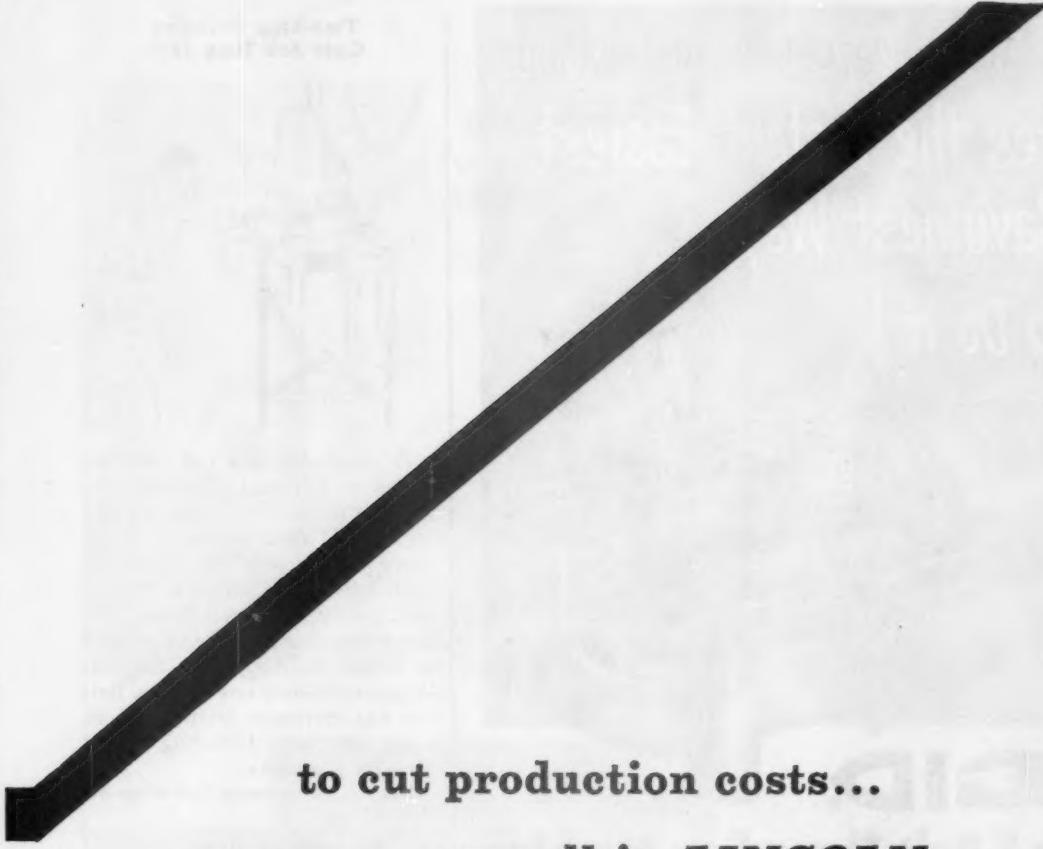
To identify a strange fish...



**you call in an ICHTHYOLOGIST**

*(specialist in fish life)*





**to cut production costs...**

**you call in LINCOLN**

*(specialists in arc welding)*

**B**ECAUSE of high operating costs a Maryland barge builder had trouble meeting competitive prices. The LINCOLN Field Engineer recommended a semi-automatic "Squirt" welder. On heavy plate it was four times faster and reduced overall costs due to reduced plate preparation and cleaning time.

As a matter of fact, right there is a good reason for doing business with LINCOLN. Cost reduction is a sort of religion at LINCOLN where production costs have dropped as much as 50% in the last 20 years. It's the result of LINCOLN'S world-famous cooperation between employees and management where everybody gets paid according to his own contribution to the company's goal—superior products and service to you at continually decreasing costs.

That's why we say it's a good idea to do business with LINCOLN where arc welding is a specialty and cost reduction comes to you as a "plus" at no charge.

To learn how LINCOLN can be of service to you, write today

**THE LINCOLN ELECTRIC COMPANY**

Dept. 2810 • Cleveland 17, Ohio



For More Information Write No. 366 on Inquiry Card—Page 34

MAY 23, 1960

295

For lots of threading, cutting and reaming

...Here's the Fastest, Easiest,  
Cost-Savingest Way  
To Do It!



**RIDGID.**

## 535 Pipe & Bolt Threading Machine Just 1 Universal Die Head and 2 Sets of Dies Threads $\frac{1}{2}$ " to 2"

**Cuts Die Changing 66%**—Two sets of dies do the work of six . . . adjust to size right in machine. One set for  $\frac{1}{2}$ " and  $\frac{3}{4}$ "; the other for 1",  $1\frac{1}{4}$ ",  $1\frac{1}{2}$ " and 2". All other RIDGID quick-opening pipe and bolt die heads and dies can be used.

**No Slow Back-Off**—Quick flip of throw-out lever retracts dies instantly, after thread is cut.

**Fast Chucking**—RIDGID Speed Chuck grips tight, forward or reverse . . . sets and releases fast by hand. Tools swing out of way for chucking of short lengths from front.

**Always True Threads**—Cam-action rear-centering device gives extra support for long pipe lengths . . . no wobble.

**Full-Floating Cutter**—Roll-type cutter with large easy-to-turn

handle has full-floating action for smooth cuts, even on out-of-round or bent pipe.

**Smooth Reaming**—Five heat-treated straight cutting flutes ream  $\frac{1}{2}$ " to 2" pipe or conduit fast and smooth.

**No Oil Waste**—Self-contained oil system has vane-type pump that circulates oil when nozzle is positioned for threading.

**Easy-to-Read Length Gauge**—Sliding indicator gives accurate cut-off and thread lengths. Large lathe-type handle controls tool movement.

**Plenty of Power**—Fast, trouble-free universal-type  $\frac{1}{2}$  h. p. motor, reversible at switch, easily threads up to 12" pipe with geared tools.

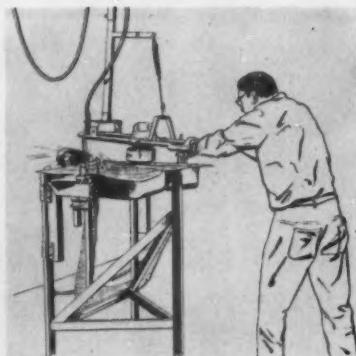
See and Try the Time-Saving RIDGID 535 at Your Supply House!

**RIDGID**

The Ridgid Tool Company, Elyria, Ohio, U.S.A.

For More Information Write No. 367 on Inquiry Card—Page 34

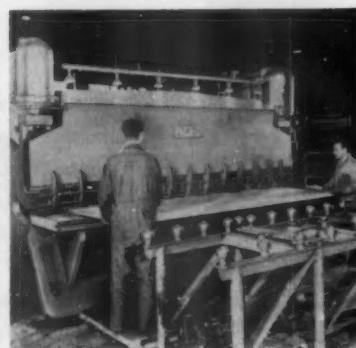
### Two-Step Grinding Cuts Job Time 57%



A manufacturer of kitchen scales cut job time 57% with two-step grinding. Using swing grinder with 24X abrasive belts to remove excess weld on seams required  $2\frac{1}{2}$  min. per sink. With a heavy-duty Ingersoll-Rand surface grinder, weld is rough ground and then finished with 40X felt in approximately one minute. Belt life has increased from 22 to 65 sinks per belt. Grinding wheel lasts for 250 sinks.

Write No. 456 on Inquiry Card—Page 34

### Features on Hydraulic Shear Speed Production

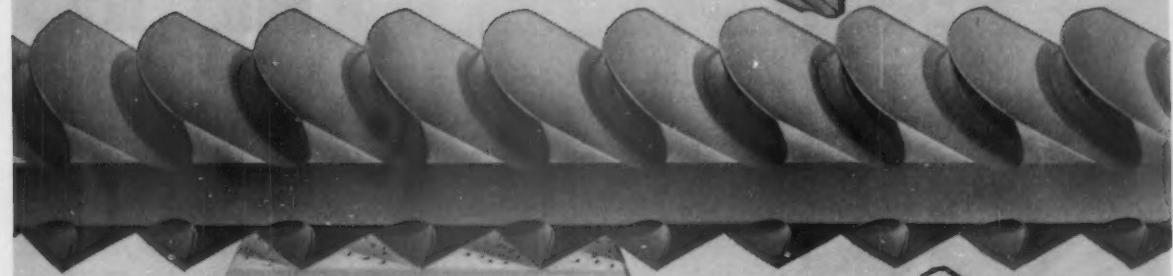
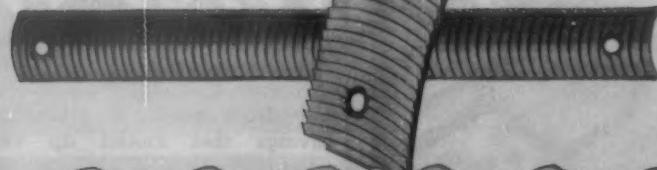


Two features on a Pacific Industrial hydraulic shear have cut preliminary training time for new operators and increased output at the Gilmore Steel Co. warehouse in Oakland, Calif. Instantaneous control stops ram at any place in plate and permits checking and re-positioning if necessary. Shear also has automatic protection against overload-damage. Both features provide operator with greater confidence and speed production. No special heavy foundations are required.

Write No. 457 on Inquiry Card—Page 34

PURCHASING

**DESIGNED  
TO PERFECT  
EVERY CAR FINISH!**



**Heller**  
**VIXEN**  
*Milled Curved Tooth*  
**Files**



SMOOTH SURFACES COME NATURALLY when Heller VIXEN Files put on the finishing touches . . . because they are designed to combine roughing and finishing in a single operation . . . producing paintable surfaces without extra filing or polishing.

THERE'S NOTHING FASTER THAN A VIXEN! Exclusive undercut teeth chew off metal in time-saving bites. The forward curve, deep gullets and wide pitch prevent loading and tracking.

TAKE THE GAMBLE OUT OF BUYING! Call your Heller Distributor for a demonstration. He has a Heller VIXEN File to fit any flat or curved surface.



17.0.18

**HELLER TOOL CO.**



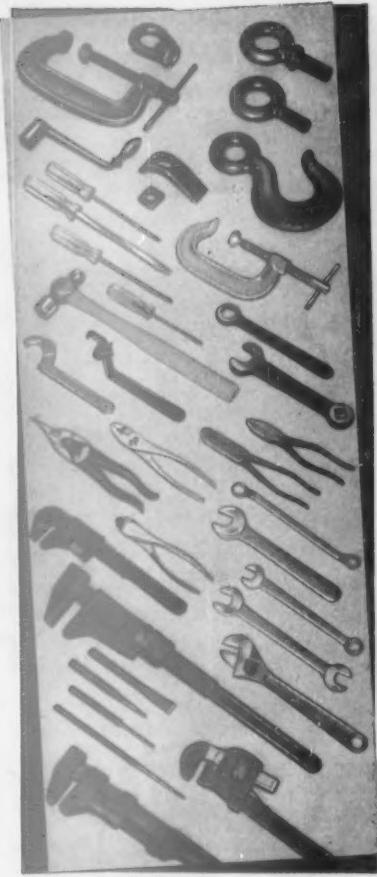
America's Oldest File Manufacturer  
**NEWCOMERSTOWN, OHIO**  
Subsidiary of Simonds Saw and Steel Co.

Branch Offices and Warehouses: Boston • Newark, N. J. • Detroit • Chicago • Shreveport • Los Angeles • San Francisco • Portland, Oregon

For More Information Write No. 368 on Inquiry Card—Page 34

MAY 23, 1960

297



## More Skill in Every Hand...

Billings quality tools get the job done with economy of time and effort... and skillfully! Scientifically designed to give proper balance and "feel". Manufactured by craftsmen experienced in the art of drop forging who know what skilled hands expect of quality tools. Billings wrenches and shop tools meet these exacting demands.

**BUY 'EM from your BILLINGS DISTRIBUTOR**

**BILLINGS**  
Drop forged  
**• WRENCHES •**  
**SHOP TOOLS**

Since 1869 Tools & Forgings of Quality  
**THE BILLINGS & SPENCER CO.**

HARTFORD 1, CONN.

For More Information Write No. 369  
on Inquiry Card—Page 34

298

### Correct Tool Selection Cuts Cost of Carbide

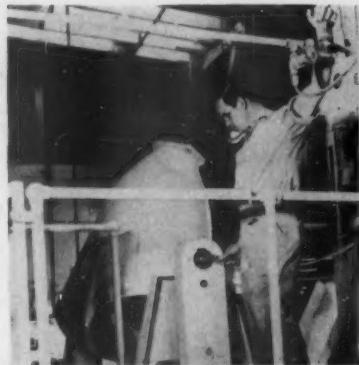
Users are now saving up to 90% as a result of a six-month study of carbide tool costs in actual use, carried out by Wesson Co. In turning, for example, carbides can be applied as milled-and-brazed flat tools, slug inserts in hand-type holders and throw-away type holders. But where any of the methods can do the job, selection of the least expensive—including tool maintenance—carbide form results in production savings that mount up very quickly.

Write No. 458 on Inquiry Card—Page 34

### Low-Cost Solution to Blending Problems

The Universal Clay Products Co. of Sandusky, Ohio, processes in finished form about 15 tons of clay per day, amounting to approximately 50,000 porcelain parts daily. Use of a 20 cu. ft. "Liquid-Solids" blender from the Patterson-Kelley Co. has reduced blending equipment costs as much as

50% and clay body mixing time as much as 20%. Patterson-Kelley blender pre-blends, disperses



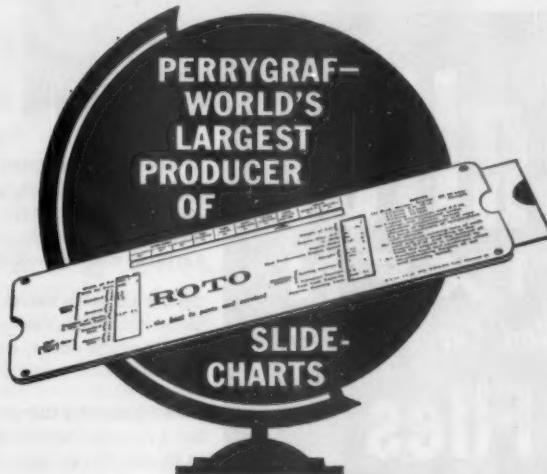
water, post-blends, and discharges 900 lbs. of clay body preparation of a spherical body granulation in 12 minutes.

Write No. 459 on Inquiry Card—Page 34

### Barrel Finishing Solves \$37,000 Problem

Precise barrel finishing techniques have solved a costly problem for the American Machine & Foundry Co. A nylon gear in its

(Please turn to page 303)



Two hundred million since 1932! More Slide-Charts for more people than any other company in the world.

Two Modern Plants, one geared to runs of millions, the other to hundreds. Finest facilities for accurate printing and assembly. Deliveries as high (in a pinch) as a million per week. Prices consistent with quality work and dependent on quantity and materials from pennies to dollars.

We invite your inquiry. Send for free full color booklet including 122 actual case histories.

### PERRYGRAF CORPORATION

1500-I Madison Street, Maywood, Illinois 150-I South Barrington Avenue, Los Angeles 49, Calif. Sales Offices in Principal Cities

For More Information Write No. 370 on Inquiry Card—Page 34

For More Information about ad on facing page  
Write No. 371 on Inquiry Card—page 34  
Purchasing

# Move up to Airco Quality



Industry's Top Line  
Welding and Cutting Torches, Tips and Regulators



BACKED BY THE MOST EXPERIENCE IN AIR REDUCTION

# AIRCO QUALITY

**Quality in Design  
Quality in Manufacture  
Quality in Service**



△ Quality starts with raw materials—this gleaming stock of copper and brass is used in the manufacture of Airco welding and cutting torches, tips and regulators.



△ The royal blue flames of automatic gas brazing make strong, smooth, uniform joints in Airco torches. This machine brazes parts in brass, bronze, copper and stainless steel.



△ A test of quality, in capable hands: every torch must prove its capacity, gas tightness and proper operation before it can bear the AIRCO trademark.



△ Costly special machines flawlessly drill tip orifices 0.025" in diameter—one more quality step in manufacturing Airco Cutting Torch Tips.



△ Tips must test out at top quality, also—every one is tested separately for accuracy of hole alignment and stability of gas flow.

Whatever your welding and cutting needs—whether they call for high **precision** or high **production**, or both—you'll get the finest results with quality Airco torches, tips and regulators. These photographs, taken at the Air Reduction Equipment Manufacturing Plant, Union, N. J., help give a small idea of how quality is the keynote from start to finish in every product that's marked AIRCO.

SEE YOUR AUTHORIZED



DISTRIBUTOR



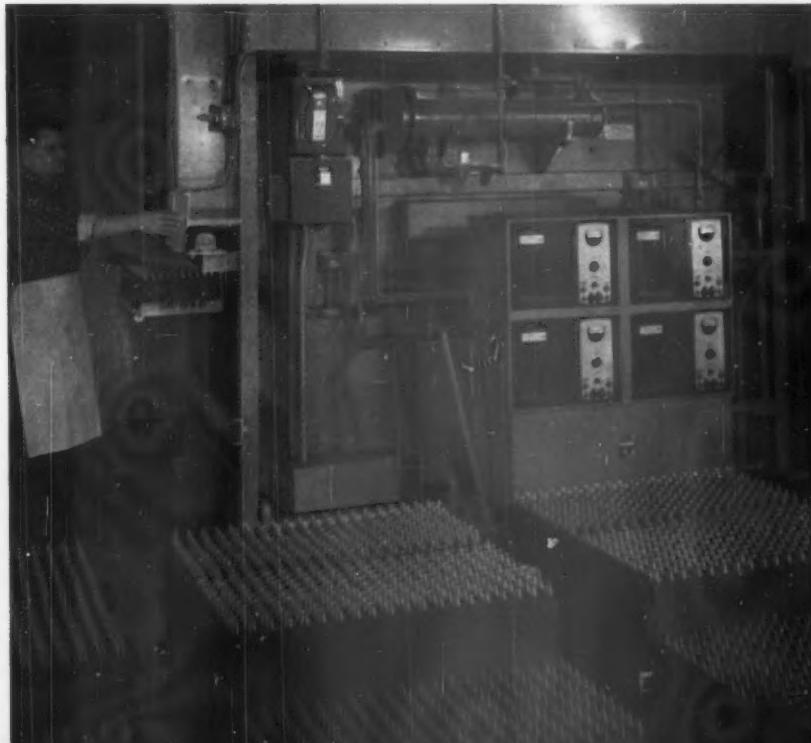
Precision means quality. This multi-spindle machine drills and taps precisely-angled holes in Airco product components.



A distinctive sheen proves quality, too. Airco takes great pains to produce top appearance as well as reliable operation in Airco Regulators.



Testing for gas tightness and accurate gas control—industry's highest testing standards mean Airco Regulators can be relied on for accuracy and durability.



Welding and cutting tips are ultrasonically stripped of burrs, chips and oils accumulated during the manufacturing process.



# AIRCO QUALITY

**...backed by the most experience**



## MOVE UP TO AIRCO QUALITY IN SERVICE, TOO

When you buy Airco products, you've bought the finest that modern manufacturing techniques can produce. But there's more than that to Airco quality.

Airco Products are backed by a nationwide network of sales offices and Authorized Distributors. This country-wide staff of experts is willing and eager to help you with your own special problems.

## AIRCO QUALITY—AS NEAR AS YOUR PHONE

You'll find an Air Reduction Sales Office, or an Authorized Airco Distributor in your classified telephone directory, listed under "Welding Equipment and Supplies." Use these outlets as your source, not only of welding and cutting torches, tips and regulators—but also for electrodes, arc welding machines, gas-shielded arc welding equipment, supplies and accessories and all industrial gases. For any welding or cutting need—call Airco.



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AIR REDUCTION PACIFIC COMPANY

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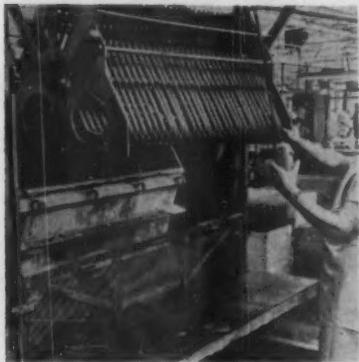
CUBAN AIR PRODUCTS CORPORATION

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AIR REDUCTION CANADA, LIMITED

All Divisions or Subsidiaries of Air Reduction Company, Inc.

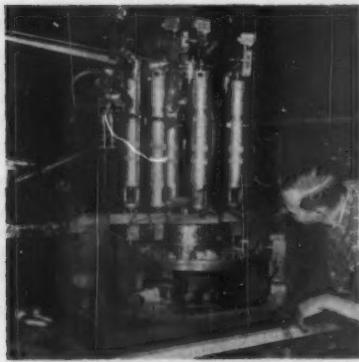
(Continued from page 298)  
pinspotter wore out too quickly where it meshed with cast teeth of the distributor track. Surface finish of the track had micro-



scopic rough spots which wore the gear. Finish was improved by using an Almco fixture-type finishing machine. Tracks now attain a 32 microinch finish at a rate of 10 minutes each, a cost reduction of \$37,000 a year.

Write No. 460 on Inquiry Card—Page 34

**Drilling Time  
Cut by 87%**



At the Hupp Aviation Division in Chicago, drilling time for 104 holes in a bearing support for a jet aircraft compressor was 2½ hours. Then Hupp switched to Gardner-Denver Airfeeddrills. Drilling time is now reduced to 20 min. per piece—a time saving over method previously used of 87%. All holes are drilled to close Air Force tolerances.

Write No. 461 on Inquiry Card—Page 34

**FOR READER SERVICE  
CARD TURN TO  
PAGE 34**



## *Would you let this salesman talk to your plant people?*

He represents Snap-on Tools Corporation — home office, Kenosha, Wisconsin. He sells hand tools for production and maintenance — items like impact socket wrenches and shanks for high-speed power assembly, mechanics' wrenches and tools for hand assembly. Far more important, he brings cost-saving ideas on tool use. For example:

He will check your production line — point out any areas where tool changes could save time, cut costs.

On problem jobs, such as close-quarter work, hard-to-reach fittings, he can recommend special tools, refer idea sketches to SNAP-ON® design engineers. Often, however, among its over 4,000 items, SNAP-ON already makes a tool that fits your needs exactly.

Before a maintenance shutdown, he will go over equipment to be serviced with your maintenance man, then check your tools and make recommendations. Properly toolled-up at the start, you eliminate costly repair delays.

If your customers require tools in the operation of your product, the SNAP-ON representative can make up special tool kits to go out with each unit you sell.

Most important, the SNAP-ON sales engineer is *qualified* by training and experience to do all these things — and more. Tools are his only business. He is a specialist in daily contact with a wide variety of tool problems.

So, would you let *this* salesman talk to *your* plant people? In companies that have, the SNAP-ON tool specialist is a welcome member of the plant team. Contact your nearest SNAP-ON branch or write us.



**SNAP-ON TOOLS**  
CORPORATION

8019-E 28th AVENUE • KENOSHA, WISCONSIN

For More Information Write No. 372 on Inquiry Card—Page 34

## LOWELL WRENCHES RATE HIGH IN VALUE ANALYSIS

Wrench efficiency is measured by speed and dependability. Time studies prove that reversible ratchet wrenches cut costs by their fast action. Always ready for quality performance are Lowell wrenches. Their high tensile handles, heat-treated steel pawls, and all-steel caps insure greater strength and safety.



### Series 50—Socket type wrench

The socket allows the bolt to pass through, and is reversible by flipping the "trigger" near the socket. Handles from 8" to 60"; square or hex sockets up to  $9\frac{1}{8}$ ".



### Series 40—Gear type wrench

The flat gear, hole-thru type, is made for heavy duty. It is reversed by a "trigger" near the gear. Handles from 24" to 48"; square or hex gears from  $\frac{3}{4}$ " to  $4\frac{5}{8}$ ".



### Series 20—Gear type wrench

Especially popular with machine tool builders, it has the reversing knob at the end of the handle. Modern appearance, and heavy duty. Handles from 7" to 36"; square or hex gears from  $\frac{1}{4}$ " to  $2\frac{3}{8}$ ".

**Call Your Local Distributor  
For Fast Service**

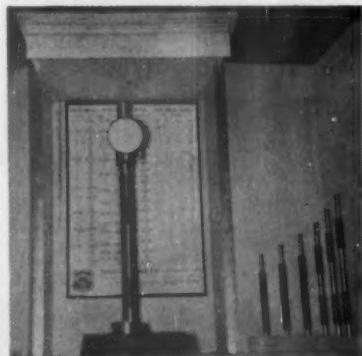
**LOWELL WRENCH CO.**

74 Temple Street  
WORCESTER 4, MASS.

For More Information Write No. 373 on Inquiry Card—Page 34



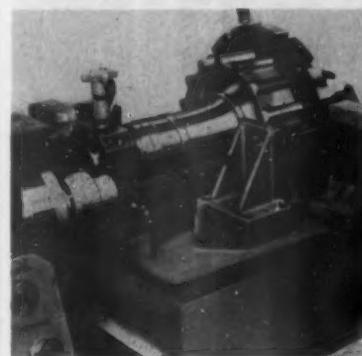
**30% Labor Savings  
with Dial Comparator**



Savings on labor costs up to 30% in checking wood die blocks are reported by the Sutherland Paper Co. of Kalamazoo, Mich. Scales formerly used were replaced by No. 653 Dial Comparator with 24 in. column and end measuring rods from L. S. Starrett Co. of Athol, Mass. Besides labor savings, accuracy is held to .0015 in. tolerance compared to the former method accurate to only .007 in.

Write No. 462 on Inquiry Card—Page 34

**Speeds Production  
Of Precision Holes**



A Canadian engine manufacturer had a problem of producing 15 precision holes on periphery of turbine rotor shaft. Hole had to be  $\frac{1}{2}$  in. dia. x  $3\frac{3}{4}$  in. long, with diameter tolerance within .001 in. Proposed method was to drill through and finish bore one hole at a time. Instead, Ex-Cello-O boring machine was employed, and holes were completed in one operation from the solid, maintaining tolerance and increasing accuracy.

Write No. 463 on Inquiry Card—Page 34

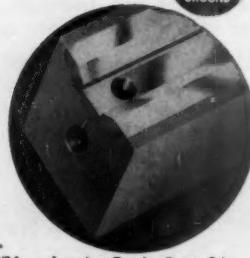
For More Information about ad on facing page Write No. 375 on Inquiry Card - pg. 34-  
**PURCHASING**

## MACHINE WAYS

Hardened-and-ground steel ways, guides, and wear plates in sizes and shapes to meet your specifications.

**COES KNIFE COMPANY**  
70 COES ST., WORCESTER, MASS.

For More Information Write No. 374 on Inquiry Card—Page 34



**COES  
KNIFE CO.**  
*Your source of:  
MACHINE KNIVES*

Standard and  
special blades of  
solid or composite  
steel, for all  
machine knife  
applications.



# SIMONDS ALL-NEW

## SUPER HIGH SPEED STEEL

### METAL BAND SAW

#### This ALL-NEW SUPER HIGH SPEED STEEL Band Saw Blade

comes welded-to-length . . . ready to use . . . in striking, new package with cutting edges protected by a special plastic cover.



The biggest advance ever in metal cutting band saw blades — that's Simonds *SUPER* High Speed Steel Metal Band Saw. No matter what ferrous metal you're band sawing, this brand new blade will give you *up to 3 times better performance* than any High Speed Steel blade you're now using!

This is not just a claim but a provable fact backed by Simonds' established reputation as a leading manufacturer of industrial cutting tools.

This *SUPER* High Speed Steel Band is an entirely new concept in band saws . . . new steel\*, new manufacturing methods, new heat treatment, new welding techniques, new final inspection.

Laboratory and field tests demonstrate that this new saw is so much better in every way for production cut-off work that we are offering it on a **PERFORMANCE GUARANTEED** basis! You can't lose — you can cut your blade costs, save on down time, get the equivalent

of up to 3 saws in better performance at a cost of only 10% more than ordinary High Speed Steel blades.

The sooner you try this new blade, the more you'll save! Get prompt delivery now of Simonds *SUPER* High Speed Steel Band through your Simonds Industrial Supply Distributor or your nearest Simonds Branch.



Your nearby SIMONDS DISTRIBUTOR is your most dependable cutting tool supply source. His stocks and services are designed with your convenience and economy in mind. Call him FIRST for all your industrial supply needs!

**SIMONDS**  
SAW AND STEEL CO.

FITCHBURG, MASSACHUSETTS

\*Developed and made in Simonds own Steel Mill — Patent Applied For

**If you use**

# **PORTABLE POWER TOOLS**

**... you need these**

Studies show that operation of inefficient portable power tools probably fritters away more production . . . wastes more payroll dollars than anything else in industry today. Yet, even in the best-run plants, this fact is often ignored or overlooked by an otherwise-alert management.

How much production are *you* losing this way? Just how efficient are your portable tools, how do you find out, and what's the most economical way to keep them at peak performance?

You can get all the answers in Ingersoll-Rand's new illustrated guidebook to more efficient power tool operation. Write for your free copy today! With it you'll get a handy, easy-to-use *Dividend Computer* for estimating how big a Dividend on Payroll Dollars you can earn in your plant in just one year with Planned Annual Retooling. Ingersoll-Rand, 11 Broadway, New York 4, N. Y.



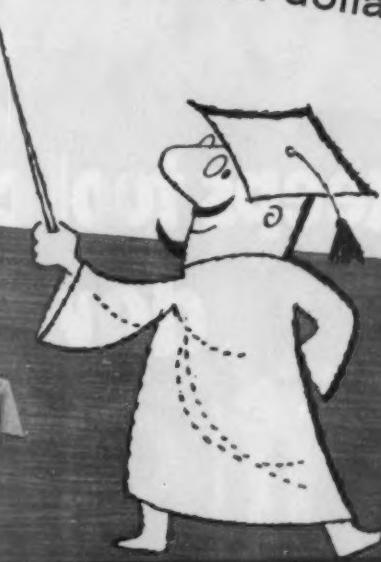
**Ingersoll-Rand**

*Planned Annual Retooling  
increases output per man*

# FREE!

how **P**lanned  
**A**nnual  
**R**etooling

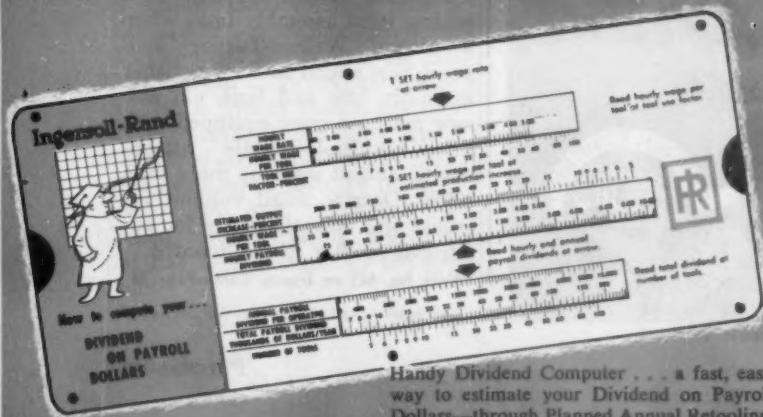
earns you a dividend on payroll dollars



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Ingersoll-Rand Co.  
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Send a copy of new guidebook "How Planned Annual Retooling Earns You a Dividend on Payroll Dollars" and a Dividend Computer to:



Handy Dividend Computer . . . a fast, easy way to estimate your Dividend on Payroll Dollars—through Planned Annual Retooling.

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Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



AT FORD AND THROUGHOUT INDUSTRY...  
TOOL BUYERS KNOW—

**keeps tool costs down!**

**S**UPREME  
**Chucks**

**SUPREME CHUCK**

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**INDUSTRIAL DISTRIBUTORS**  
**THE RIGHT HAND OF PRODUCTION**

**SUPREME PRODUCTS CORPORATION**  
DIVISION OF A-S-R PRODUCTS CORPORATION  
2222 S. CALUMET AVE. • CHICAGO 16, ILLINOIS

For More Information Write No. 377 on Inquiry Card—Page 34

For More Information about ad on preceding  
page Write No. 376 on Inquiry Card—pg. 34  
308

### Honing Process Replaces Four Manual Operations



To obtain proper sizing of two holes in its riveter cylinder head, the Chicago Pneumatic Co. relied on four hand operations, three reaming and one valve lapping. All were eliminated when the company changed over to a Sunnen honing process which made it possible to hold the holes within .0002" tolerances consistently and made the valves interchangeable.

Write No. 464 on Inquiry Card—Page 34

### Multiple Drilling and Tapping Pays Off

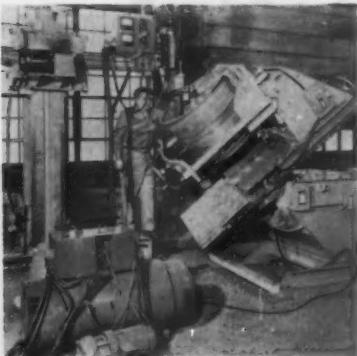


General Electric's plant at Paterson, N. J., proved that very little volume is needed to justify multiple drilling and tapping with a separate spindle for each in a seldom used assembly line. When a second Walker-Turner drill press was added in floor polisher assembly line and both old and new machine were equipped with Ettco multiple-spindle attachments, output went up more than 300%. Despite small volume, increase was enough to pay for additional tooling in six months.

Write No. 465 on Inquiry Card—Page 34

PURCHASING

**Standard Equipment  
Solves Welding Problem**



A standard 6000 lb. gear-driven Aronson welding positioner together with a standard Herrick headstock and manipulator enabled an Eastern manufacturer to avoid the high cost of special machines. A package installation using only simple tooling makes it possible to produce high quality, low cost inside fillet welds on steel wheels which weigh from 400 to 1000 lbs. each and have diameters from 22 to 40 in.

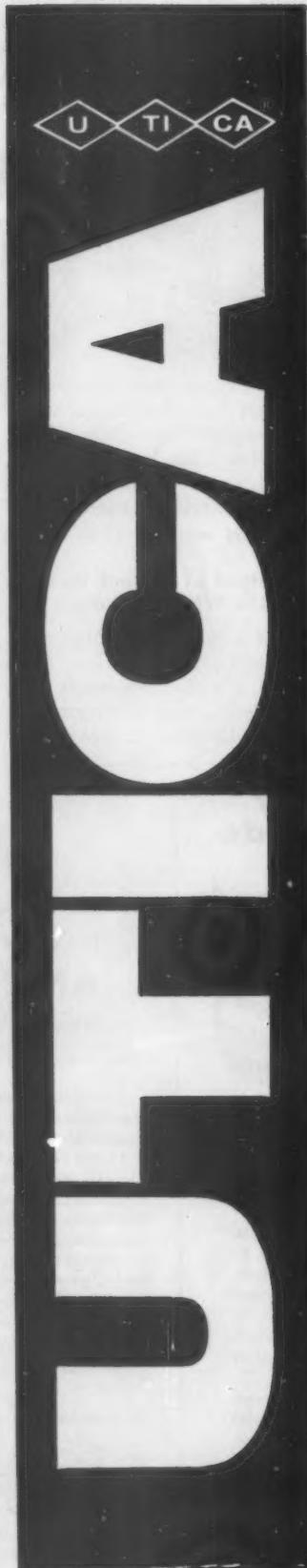
Write No. 466 on Inquiry Card—Page 34

**Output on Standard  
Drill Press Doubled**



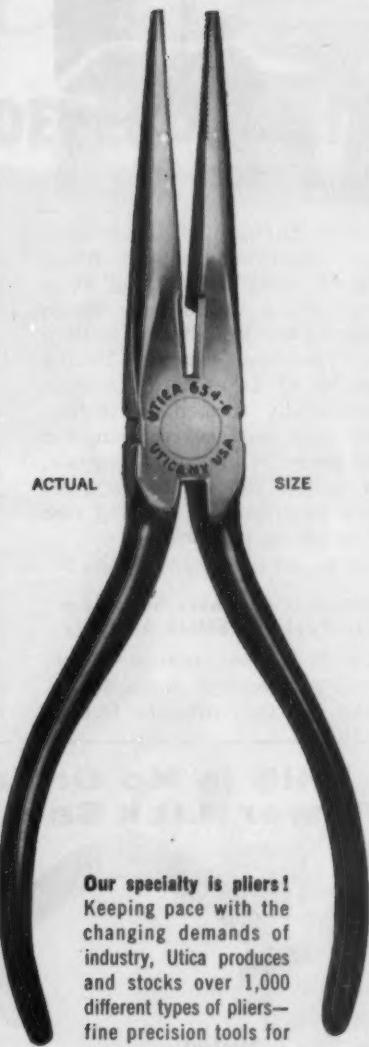
The rate for drilling two holes in camera parts castings with a standard drill press has been more than doubled at the Sterling Die Castings Co. of Brooklyn. Credit goes to a fixture that holds two parts instead of one plus pneumatic feed and a four-spindle multiple-head on a Delta 17 in. drill press. Two 3/16 in. holes are drilled in each casting, and output has been boosted to 400 per hour.

Write No. 467 on Inquiry Card—Page 34



ACTUAL

SIZE



**Our specialty is pliers!**  
Keeping pace with the changing demands of industry, Utica produces and stocks over 1,000 different types of pliers—fine precision tools for every conceivable use. Because of the job we have been able to do in many of the country's largest and most specialized plants, we believe that Utica tools can help you, too—either reduce your costs or improve your products. Contact your Utica distributor, today.

**Utica Drop Forge & Tool  
Division, Kelsey-Hayes  
Company, Utica 4, N. Y.**

**tools the experts use!**

For More Information Write No. 378 on Inquiry Card—Page 34

### Bending Machine Permits Inventory Reduction



Linde Division of Union Carbide Corporation reduced inventory of costly fittings and eliminated many welding operations required by the fittings with a Pines bending machine. Tubing from  $\frac{5}{8}$ " O. D. up to 6" O. D. is economically formed for equipment that produces oxygen and inert gases for industry, hospitals, and homes. The machine is profitably employed in bending one to ten pieces per setup.

Write No. 695 on Inquiry Card—Page 34

### Ultrasonic Cleaners Save Lens Manufacturer \$6000 Annually

Contact Lenses are made of relatively soft methyl methacrylate plastic, yet they must be free of

scratches and oily particles. Mueller Welt Contact Lenses of Chicago minimized hazardous manual cleaning and saved \$6,000 a year by turning to ultrasonic



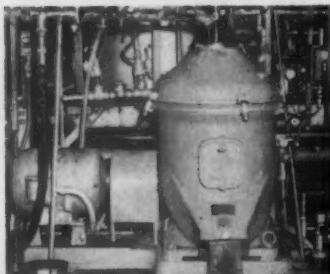
cleaning. Now two SonBlaster one-gallon transducerized ultrasonic cleaning tanks from Narda Ultrasonics Corp. of Westbury, N.Y. wash more than 5000 lenses a week to surgical cleanliness.

Write No. 696 on Inquiry Card—Page 34

### Output of Extract Up 140% With Centrifuge

Use of a Titan centrifuge, supplied by The Pfaudler Co., a division of Pfaudler Permutit Inc., has boosted output of enzyme extract at Lederle Laboratories'

Pearl River, New York plant, from 25 to 60 ghp—an increase of 140%. Labor has been cut by



at least 50%, only one man being required part time to operate the unit.

Write No. 697 on Inquiry Card—Page 34

### Straightening Fixture Saves Over \$6000 in Year

An electrical switchboard manufacturer used to straighten angle irons by hand with a heavy sledge hammer. The noise, damage to material, and inaccuracy of method led to the installation of a hydraulic straightening fixture powered by Blackhawk Porta-Power components. The compact

(Please turn to page 313)

## THIS Is No Ordinary Power Hack Saw Blade



This is the *unbreakable* MARVEL High-Speed-Edge Hack Saw Blade—the first bi-metal blade—invented, developed and introduced by MARVEL. This blade was developed to cut any material from the free machining steels to the toughest alloys, fast, accurately and economically. Just one type blade to handle any job—no switching blades to cut different materials.

MARVEL blades can be tensioned from 200% to 300% more taut than ordinary blades. This advantage permits heavier feed pressures to be used without deflection or fear of breakage.

This rugged cutting tool assures outstanding economy, accuracy, long life and complete safety—it is *unbreakable*.

Ask for MARVEL Blades by name and you can be sure you're getting the best. Leading Industrial Distributors have them in stock. Write for latest Cutting Tool Bulletin.

FB-1021

### ARMSTRONG-BLUM MFG. CO.

5700 W. Bloomingdale Ave., Chicago 39, U.S.A.

Manufacturers of the Outstanding MARVEL Metal Saws

For More Information Write No. 379 on Inquiry Card—Page 34

Announcing  
an important new development  
for quality control measurement  
**AMES MODEL AG7**  
Accu-Flow\* Air Gage Recorder

A permanent record of continuous measurements can be made in magnifications of 1750 to 1-3500 to 1 and 17,500 to 1.

The AG7 provides a completely impersonal measurement record that can be used both as a controlling device and as a means of furnishing visible "proof of precision" to buyers of the measured products. Send for free ACCU-FLOW folder.

\*Trademark of B.C. Ames Co.



Representatives in Principal Cities

**B.C. AMES CO.**

31 Ames Street, Waltham 54, Mass.

Canadian Representative—H.C. Burton Co. Ltd., Hamilton

MANUFACTURERS OF MICROMETER DIAL INDICATORS AND GAGES

For More Information Write No. 380 on Inquiry Card—Page 34

For More Information about ad on facing page  
Write No. 381 on Inquiry Card—page 34  
PURCHASING

# compare

**TORQUE • PERFORMANCE • DEPENDABILITY**



*BUY  
A...*

# SIOUX

AIR or ELECTRIC  
**IMPACT WRENCH**



## Air impact wrenches deliver

# up to 15% more torque

## while consuming 30% less air!



NO. 322

Superiority of their mechanical design is revealed in the unusual efficiency of Sioux Air Impact Wrenches. Wrench for wrench, model for model, size for size, SIOUX can be counted upon to deliver an average of 15% more torque, while consuming 30% less air! Less power is absorbed by the wrench itself. More is applied to the drive. Three Sioux

wrenches can be operated on the existing air supply for every two of another kind. This correctness of engineering design has also produced a wrench of superior endurance, longevity, and freedom from trouble. Low first cost, higher torque, lower air consumption and long trouble-free life add up to make SIOUX THE BIG BUY IN AIR IMPACT WRENCHES!

No guess work with . . . .

CERTIFIED



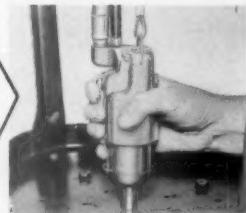
When it's a Sioux, you know what it will do! Sioux tells you the torque your air or electric impact wrench will deliver. You don't buy just a wrench. You buy certified Sioux power, reversible power, and on air wrenches controllable power through eight point power selector.

**A SIZE FOR  
EVERY NEED!**

From the big No. 322 Sioux Air Impact Wrench (upper left) capable of up to 1,000 foot pounds of torque at 90 pounds of air pressure, to the little No. 313 (pictured at right) which weighs 2½ pounds and can deliver up to 80 foot pounds of torque, there's a full range of Sioux impact wrench sizes and models.

### REACTION BALANCED for Less Vibration Feed Back

All Sioux Impact Wrenches are "reaction balanced" for less vibration and torque feedback and for minimum operator fatigue. There's less shock and twist when the wrench impacts. You can feel the difference!



**SIOUX**  
*Electric*  
**IMPACT**  
**WRENCHES**



**SIOUX** Electric Impact Wrenches offer equal power in right or left hand rotation. The torque for each wrench is stated and certified. Their mechanical design offers exactly the same advantages as

that of the air wrenches. Their exclusive reverse cap switch lock prevents reversing with the current on, and eliminates burning commutator brushes and switch contacts. Their efficiency, performance, and freedom from trouble are unexcelled.

Look under "TOOLS, ELECTRIC" in the Yellow Pages

**ALBERTSON & CO., INC.**

SIOUX CITY, IOWA • U.S.A.

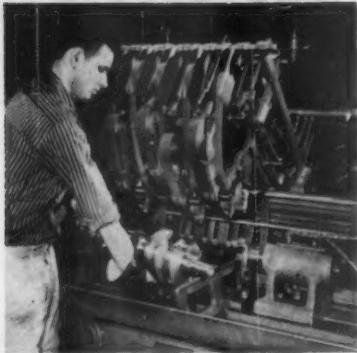


AIR IMPACT WRENCHES • AIR SCREWDRIVERS • ELECTRIC IMPACT WRENCHES • ELECTRIC SCREWDRIVERS • DRILLS • GRINDERS  
• SANDERS • POLISHERS • FLEXIBLE SHAFTS • PORTABLE SAWS • VALVE GRINDING MACHINES • ABRASIVE DISCS

(Continued from page 310)  
unit does the job faster and more accurately and saves \$24 per day in labor costs. After amortizing the cost of the fixture, savings added up to \$6144 the first year.

Write No. 698 on Inquiry Card—Page 34

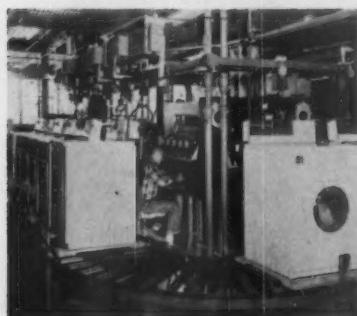
**Switch to Abrasive Belts Doubles Production Rate**



A large Southern pulp mill reduced grinding and finishing time by 50% by switching to Carborundum abrasive belts to size and finish chilled iron king rolls used in paper making. A progression of belts, from fine to coarse, was used in order to achieve low micro-inch finish.

Write No. 699 on Inquiry Card—Page 34

**Temperature Controllers Check out Washer-Dryers**



Thermistor type temperature controllers made by Fenwal Inc. make it possible for two men to check five Easy washer-dryers at a time at the Murray Corp., Syracuse, N.Y. Although mechanical functioning can be checked by observation, heat levels and cycling require careful instrumentation. A gang set-up of thermistor controls lets two men do the job—one loads machine and checks mechanical functions; the other makes all connections, monitors the controllers.

Write No. 700 on Inquiry Card—Page 34

**NEW... IMPROVED... model 15A**



**the STRIPPIT  
FABRICATOR**

*for high-profit, low-cost punching,  
notching and nibbling...for prototype,  
short and medium production runs*

**FEATURING** the new Strippit Electro-Hydramatic Head — simplified design . . . minimum number of parts . . . needs no pressurized air. Makes the 15A easier to install, simpler to maintain, more economical to operate.



**punches**

any round or shaped hole up to 3½" diameter in sheet material  
— up to ¼" mild steel.

**notches**

90° corners — rectangular, radii, vee and special shape edge notches  
— up to ½" capacity in mild steel.

**nibbles**

straight line or contour shearing up to 38" diameter circle, at 165 strokes per minute, ½" mild steel.

**accurate, quick-set gauging**

a unique, multiple-stop system for exact work positioning to any layout specifications — in seconds.

**quick-change punches and dies**

from one size to another in less than 20 seconds — within easy reach in labeled, built-in file drawers.

**easy conversion**

to a high speed production punching unit with the Strippit Duplicator and the Dupl-O-Scope or Microbars to punch Duplicator templates.

**WRITE TODAY**

for new Catalog 15A and demonstration at your own plant of the capabilities of this high-profit fabrication system.



WALES

**STRIPPIT** INC.

229 Buell Road • Akron, New York

In Canada: Strippit Tool & Machine Company, Brampton, Ontario

For More Information Write No. 382 on Inquiry Card—Page 34

# NEW!

## Linde SIGMATIC Welders



**SWM-13** cart-mounted unit with separate control cabinet rolls readily over hoses, minor obstacles, slings easily from adjustable handles.

**SWM-12** sled-mounted unit with separate control cabinet passes easily through small openings, can be slung from rigid tubular handles.

# for All Mig Welding Jobs



**SWM-11** features compact mounting of wire feed unit and wire spool on angular welded steel structure; combination continuous-fusion and spot-welding unit, SWM-11-S, is also offered.

For More Information Write No. 383 on Inquiry Card—Page 34

MAY 23, 1960

LINDE's new "Sigmatic" line gives you the most adaptable and versatile mig welding equipment available today. With one of these units, you can weld virtually any metal, in almost any thickness. You can use wire from .020 in. to 3/32 in. diameter (including cored wire) and any shielding gas you select.

Versatility is engineered into the "Sigmatic" line. On the SWM-11, you can change from horizontal to vertical wire feed in minutes. With any unit, you can use conventional "spray-arc" or the LINDE "short-arc" process which has proved so successful on thin steels. Dual-purpose units are available which handle both spot welding and continuous fusion welding.

Several styles of torches are available, ranging up to 500-ampere capacity. Control cabinets are designed and wired for maximum ease of service and for internal addition of special operating features selected to fit your needs.

The same development and laboratory facilities that planned and built this equipment are available for help in applying it to your welding problems. For information on a demonstration see your LINDE representative. Or write for catalog F-1372, Dept. P-054, Linde Company, 270 Park Avenue, New York 17, N. Y.

**LINDE  
COMPANY**

**UNION  
CARBIDE**

"Linde", "Sigmatic", and "Union Carbide" are trade marks of Union Carbide Corporation.

For More Information about ad on following page Write No. 384 on Inquiry Card - pg. 34-35

R  
R  
R  
R



## is for Redmond

**The Name to Specify When You Need Trouble-Free,  
Whisper Quiet, Economical Motors**

Redmond specializes in just one thing—the design, development, and manufacturing of fractional horsepower electric motors—we make no products to compete with you. Redmond motors are tailor-made to fit each specific application exactly, and therefore give you the most economical, efficient, high-quality, long-life motors available.

Redmond's complete and modern application laboratory is available to custom-tailor motors for customers and prospects. Regional offices are staffed by qualified sales engineers who can conduct complete tests and assist you in application engineering. Contact us at Owosso, Michigan, and the Redmond Sales Engineer in your area will call you at once.

### FRACTIONAL HORSEPOWER ELECTRIC MOTORS

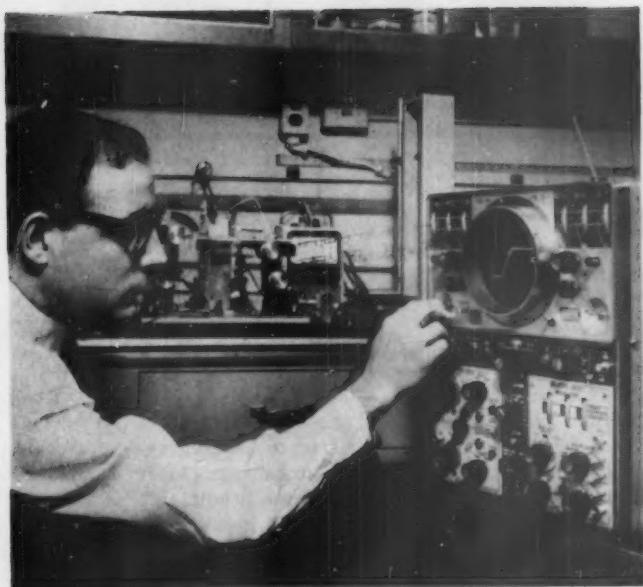


### NEW CATALOG

New 12-page catalog describes and illustrates basic line of Redmond fractional horsepower electric motors, blowers, and special products. Send request for your free copy to Redmond Company, Inc., Owosso, Michigan



THE BIG NAME IN SMALL MOTORS



V

## Electrical Equipment

A

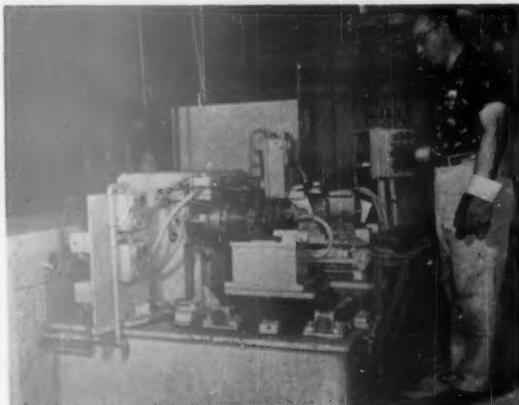
## Electrical Equipment



### Automatic Control System Positions Steel Pipe at Welding Stations

Steel pipe is automatically positioned at each welding station by a Cypak control system at the Consolidated Western Steel Company, Provo, Utah. The pipe-manipulating devices are sequenced so that the first pipe to enter the storage area will stop at the first inside-diameter, semi-automatic welder station. If one of the succeeding welders at any of the five stations needs this pipe, the operator presses his call button and it is automatically advanced to him.

Write No. 385 on Inquiry Card—Page 34



### \$100,000 Annually Saved Through Shrink Fitting by Induction Heating

By switching from air presses to Tocco induction heating for fitting 1/5 hp through 1½ hp motor housings and stators, Copeland Refrigeration Corporation saves \$100,000 annually. In addition, stator scoring and distortion are eliminated. Motor housings are heated to 400 degrees F. resulting in up to .013 inch expansion. After cooling, the housing shrinks to form a predictable and perfect fit with the stator.

Write No. 386 on Inquiry Card—Page 34

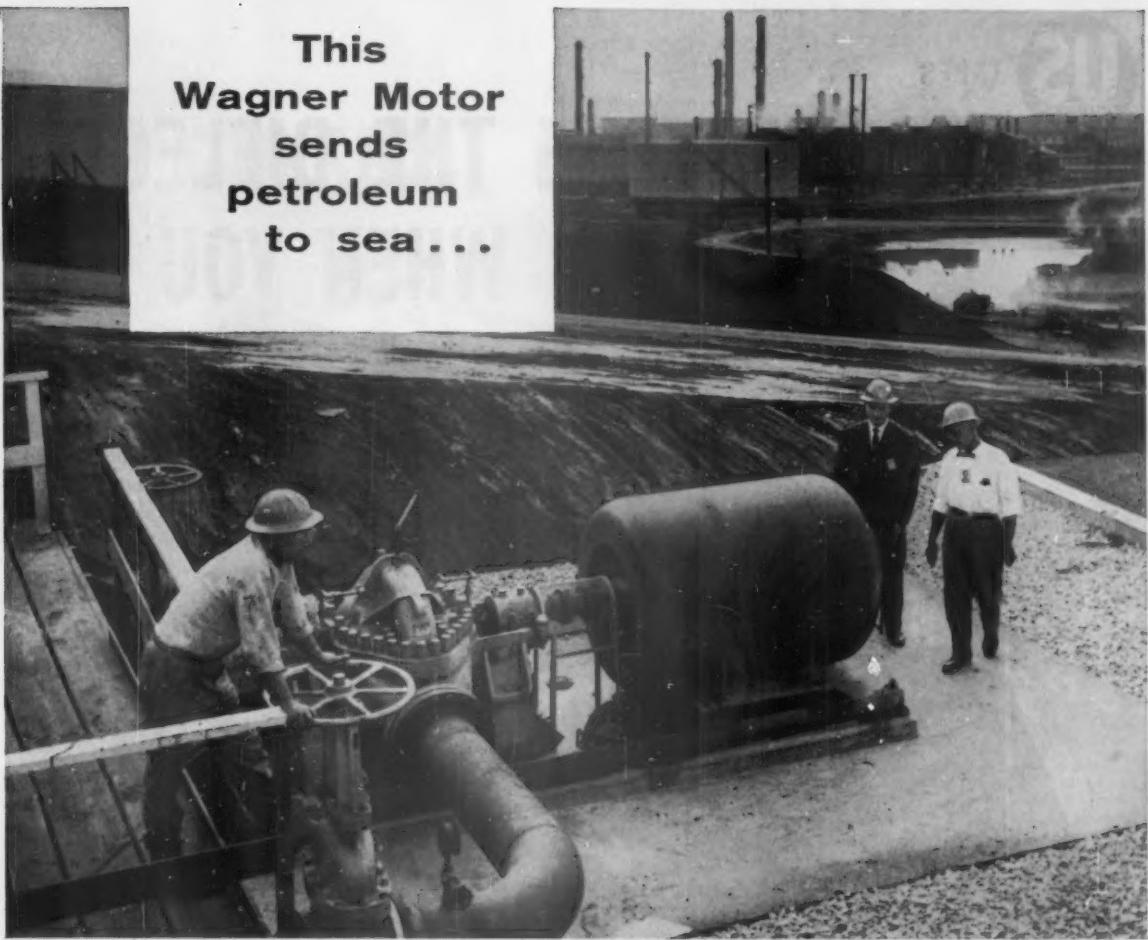


### Silicone-Rubber Insulated Open Motor Operates in Abrasive Atmosphere

A silicone-rubber insulated open Super-Seal squirrel-cage induction motor drives a limestone reduction mill at the Quality Limestone Co., Sussex, Wis. Even in this abrasive atmosphere, the machine requires no protective housing to shield the stator windings from moisture, chemicals, oils, and corrosives. In addition to resisting shock and vibration, it withstands high temperature due to the thermal stability of the insulation.

Write No. 387 on Inquiry Card—Page 34

**This  
Wagner Motor  
sends  
petroleum  
to sea ...**



This 500 hp WAGNER Type ZP Tube Ventilated Motor pumps oil from storage to tankers 2 miles away.

Big job, moving petroleum products to market. Standard Oil of California does it well... helped, at its El Segundo Refinery, by this 500 horsepower Wagner Tube Ventilated Motor. This explosion-proof motor's job: provide the power to pump crude oil from storage tanks down to the sea—and waiting tankers—two miles away.

Starting oil on a bon voyage is just one of many heavy-duty jobs performed by Wagner Tube Ventilated Motors. They also power big fans, blowers...any heavy-duty application that must be operated for long periods of time without a shut down.

These motors have fabricated steel frames that contain a series of tubes (as shown in photo below) through which cooling air is forced by an external blower. Internal blowers, one at each end of the rotor, circulate the warm air inside the motor through ducts in the rotor and stator and around cooling tubes. This effective cooling system holds the operat-

ing temperature of the motor within specified limits to lengthen motor life.

Whatever your motor requirements—large or small, for plant or product—Wagner can supply a standard motor or build a special motor to fit your needs. More than 65 years of constant research and development in electric motor design have made Wagner a name you can depend on. Call your nearby Wagner Sales Engineer for an analysis of your next motor application. There are Wagner branches in 32 principal cities.



WM60-11

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

**Wagner Electric Corporation**

6360 PLYMOUTH AVENUE, ST. LOUIS 33, MISSOURI

SERVING 2 GREAT GROWTH INDUSTRIES—ELECTRICAL • AUTOMOTIVE

For More Information Write No. 388 on Inquiry Card—Page 34

MAY 23, 1960

319



TAPES

# YOU RESTORE THE DIELECTRIC WHEN YOU TAPE



## U. S. SECURITY RUBBER TAPE

The ideal commercial quality of unvulcanized rubber tape for all general electrical work.

U. S. Security rubber splicing compound possesses all the necessary physical properties: tensile elongation, tackiness and dielectric strength required for good, durable splices.

It is easy to handle and will fuse into a solid mass without the application of heat or undue pressure.

Here are famous brands preferred by electricians wherever wire or cable must be repaired in utilities, factories or mining service. After the splice has been made, restore the dielectric qualities of your original insulation with a rubber tape and then protect its physical and abrasion resistance by an additional covering of friction tape.

## U. S. SECURITY® FRICTION TAPE

Although competitively priced, this outstanding grade of electrical and general-purpose tape has all the characteristics of higher priced tape. It contains no pinholes — does not ravel when unwound from the roll — tears straight.



# AND PHYSICAL QUALITIES WITH "U. S."



## U. S. HOLDTITE® FRICTION TAPE

Contains no free sulphur or other ingredients injurious to metals or fabrics. Exceeds all the physical requirements of the A.S.T.M. specification. Handles cleanly without raveling or waste — has no pinholes — has high dielectric strength for high voltage jobs.

It has unusually high tensile strength and strong adhesion and makes splices that are durable and lasting.

## U. S. HOLDTITE SPlicing COMPOUND

A high-grade rubber splicing compound exceeding A.S.T.M. requirements.

U. S. Holdtite rubber splicing compound is economical when considered on a cost-per-foot basis. Its high dielectric strength, combined with its fine tackiness and fusing qualities, insures perfect splice.



When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical advice, quick delivery and quality industrial rubber products.

Mechanical Goods Division



# United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

For More Information Write No. 389 on Inquiry Card—Page 34

MAY 23, 1960

321

## Electrical Equipment



### X-Ray Gauges Measure Accurately Within Plus or Minus 1/10,000 Inch

Twin non-contact x-ray gauges measure continuously coils of pure nickel of thicknesses from .020 inch to .001 inch at Driver-Harris Company, Harrison, N.J. with an accuracy of plus or minus one ten-thousandth of an inch. Previously, contact gauges were used to control thickness measurements, but accuracy was only plus or minus 5%. It is no longer necessary to spend time spot checking the finished strip with hand micrometers using the non-contact gauges made by Daystrom, Inc.

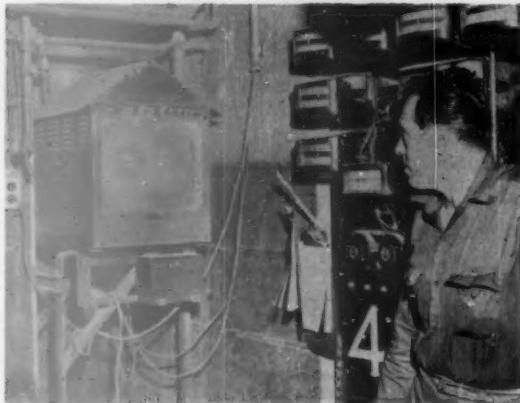
Write No. 390 on Inquiry Card—Page 34



### Automatic Welder Saves 70% in Joining Square, Rectangular Shapes

Square and rectangular shapes for grain elevators are welded automatically at Huss & Schleiper Manufacturing Company, Decatur, Ill. at a savings of 70% over the former method. Previously the pieces were manually welded. Now the Miller Sigma-3CS constant potential type welder moves pieces under the welding torch at a pre-determined rate. Travel speed, argon flow, water shut-off, and high frequency starting are fully automatic.

Write No. 391 on Inquiry Card—Page 34



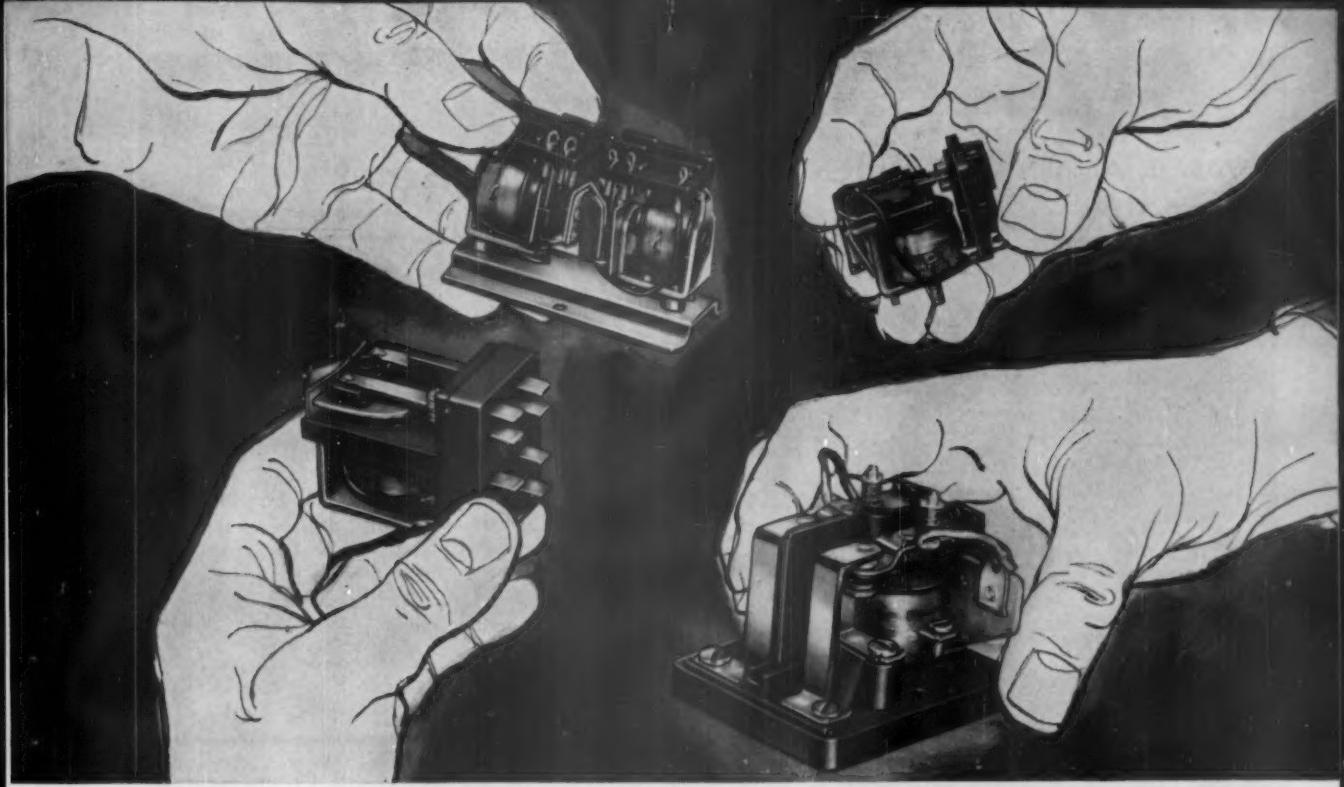
### Closed-Circuit TV Monitor System Saves Over Twice Its Cost in Year

By using a closed-circuit television system costing \$4000, an industrial firm saves over \$10,000 annually. The system, made by General Precision, Inc., allows the company to monitor the electric demand meter and control power consumption by switching furnaces—so that peak electric power demands far above average could be avoided. A plant employee watches the meter reading on a TV monitor and makes the necessary load adjustments to keep the demand from exceeding certain limits.

Write No. 392 on Inquiry Card—Page 34

For More Information about ad on facing page  
Write No. 393 on Inquiry Card—page 34→

PURCHASING



## save time! save money! call your parts distributor for **P&B RELAYS**

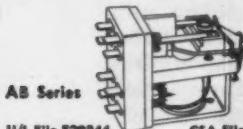


These important savings are yours when you order—from your Electronic Parts Distributor—P&B relays listed with Underwriters' Laboratories, Inc. and Canadian Standards Association:

**SAVE TIME.** You get fast, off-the-shelf delivery. Usually your order is shipped the day after it is received. And no waiting for U/L or CSA clearance . . . this has been done for you. Thus you get your project—and your product—off to a fast start!

**SAVE MONEY.** You save the cost of getting relays listed with U/L or CSA . . . and you need have no big investment in shelf inventory, either. Remember, you pay no premium over factory prices in quantities to 249.

More than 40 different standard P&B relays in 450 different coil voltages and contact arrangements are available from the leading Electronic Part Distributors in your area. For special applications, call your nearest P&B sales engineer.



AB Series

U/L File E29244

CSA File 15734

ABC Series

U/L File E29244



CSA File 15734

Medium duty power relay in dust cover. For small motors, industrial controls and similar applications. Contact arrangement: DPDT. Rated at 10 amps, 115 V., 5 amps, 230 AC non-inductive by U/L and CSA.



KA Series

U/L File E29244

CSA File 15734

KA Series

U/L File E29244

CSA File 15734

Small, low cost, general purpose relay for handling automation work, small motors, solenoids, other relays. Contact arrangements: SPDT, DPDT and 3PDT. Rated at 5 amps, at 115 V., AC non-inductive by U/L and CSA.



KB Series

U/L File E29244

CSA File 15734

Compact latch relay ideal for memory work and overload applications. Operates on momentary impulse to either coil. Contact arrangements: 4PDT and 6PDT. Rated at 5 amps at 115 V., AC non-inductive by U/L and CSA.



PR  
Series

Type	Contact Arrangement*	Type	Contact Arrangement*
PRIAY	SPST-NO	PR5AY	SPDT
PR3AY	SPDT-NO-DM	PR7AY	DPST-NO
PR11AY			DPDT

These relays are available in any of the following operating voltages: 6, 12, 24, 115, 230 volts 50/60 cycles AC.

Contacts are rated at: 25 amps, 115/230 V. AC 1 phase, 1 hp for 115/230 volt AC motors 1 phase.

\*Read: NO normally open, NC normally closed, DM double break, DM double make.

U/L File E29244

CSA File 15734



# POTTER & BRUMFIELD

DIVISION OF AMERICAN MACHINE & FOUNDRY COMPANY, PRINCETON, INDIANA

IN CANADA: POTTER & BRUMFIELD CANADA LTD., GUELPH, ONTARIO

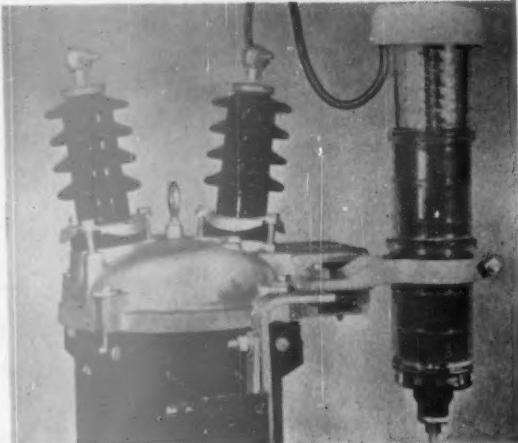
## Electrical Equipment



### Aluminum Switchgear Housing Reduces Installation and Maintenance Costs

A manufacturer who didn't want to use valuable floor space for switchgear but wanted the substation near the load, cut installation and maintenance costs with Aluma-Clad housing. Made from extruded aluminum sections, the housing is inherently resistant to weather conditions. Cranes or other lifting facilities aren't needed for placing the panels because of lightweight modular construction.

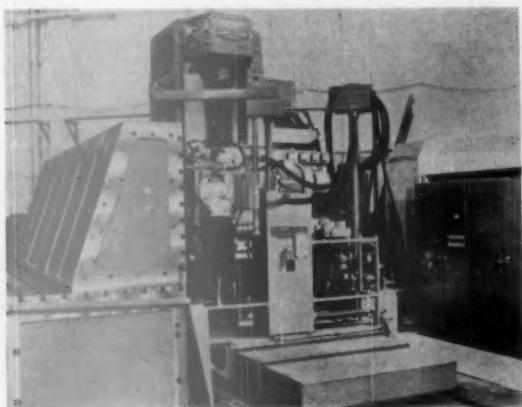
Write No. 394 on Inquiry Card—Page 34



### Dismantling of Lightning Arresters Eliminated by Glass Enclosures

Installation of Pyrex glass enclosures for lightning arresters cut time, effort, and costs for the Line Materials Company. Previously arresters could be checked out only by dismantling the units, thereby requiring power cutoffs. Now crews can make visual inspections and replace damaged units before emergencies. The heat-resistant glass withstands thermal shock, is mechanically strong, and has good insulating characteristics. It is non-corrosive and can be permanently sealed against moisture.

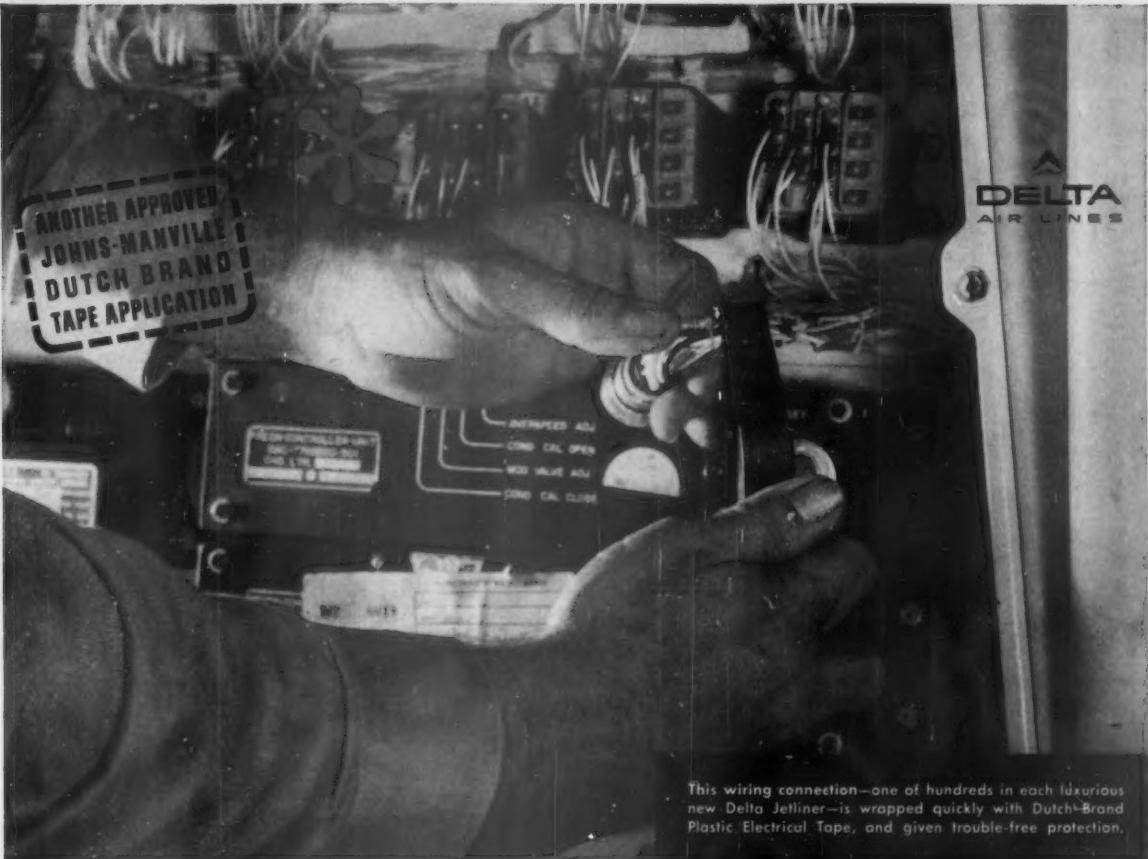
Write No. 395 on Inquiry Card—Page 34



### Numerical Controls Reduce Machining Time 78% for Intricate Plane Parts

To reduce machining time and tooling costs over conventional template or pattern tracer methods in machining wing spar caps and fuselage formers, Republic Aviation Corp., Farmingdale, N.Y. uses a numerical control system. The system, built by Bendix Aviation Corp., saves 73% and 55%, respectively, in machining time for fuselage formers and spar caps. Additional savings are expected when computer sub routines are available to automatically calculate three-dimensional contours.

Write No. 396 on Inquiry Card—Page 34



This wiring connection—one of hundreds in each luxurious new Delta Jetliner—is wrapped quickly with Dutch-Brand Plastic Electrical Tape, and given trouble-free protection.

## Why Delta Air Lines Chose J-M Dutch Brand Plastic Electrical Tape for Trouble-Free Electrical Maintenance



\* Before choosing Dutch Brand Plastic Electrical Tape for the new application of Jetliner maintenance, Delta knew the trouble-saving value of its *complete combination of protective properties*—Delta was already using 75 miles of the tape annually to service its prop fleet.

A single thickness of Dutch Brand Plastic Electrical Tape provided high dielectric strength. It resisted oil, grease, acids, alkalies, abrasion, weather, corrosive salts and fumes—almost all

conceivable enemies of wiring connections. Easy to use, the tape adhered fast, readily stretched and conformed to irregular surfaces, wrapped and sealed tightly. A finished job of just one or two snug turns meant *trouble-free protection—at a savings of tape, taping time, expense.*

For idea-suggesting reading valuable in your operations, get the new booklet, "How J-M Dutch Brand Tapes Helped Solve Maintenance Problems at Delta Air Lines". Write today.



**JOHNS-MANVILLE DUTCH BRAND DIVISION**  
7800 South Woodlawn Avenue, Chicago 19, Illinois  
In Canada—Johns-Manville Co., Ltd., Port Credit, Ontario

# JOHNS-MANVILLE



For More Information Write No. 397 on Inquiry Card—Page 34

## Electrical Equipment



### Infra-Red Heating Keeps Plant Workers Warm When Temperature Falls

Infra-red heat from Perfection-Schwank generators keeps workers warm even when air temperature falls below comfort level. The units—rated at 168,000 BTUH—permit Junkin Safety Appliance Company, Louisville, Ky. to heat only half of an unpartitioned building in severe weather when an employee is at work station directly under it. Previously, the company had used two forced air space heaters totaling a 185,000 BTUH input, one on either side of the building; however, these did not provide sufficient heat.

Write No. 398 on Inquiry Card—Page 34



### Power Transformers Handle Easily With Light Capacity Hoisting Gear

A company that had only light capacity hoisting equipment switched to Allis-Chalmers power transformers because they could be handled easily by small crews. The transformers can be mounted on piers, planks, or a lightweight concrete pad and can be concealed with little landscaping. Grouped accessories allow simplified periodic inspections.

Write No. 399 on Inquiry Card—Page 34



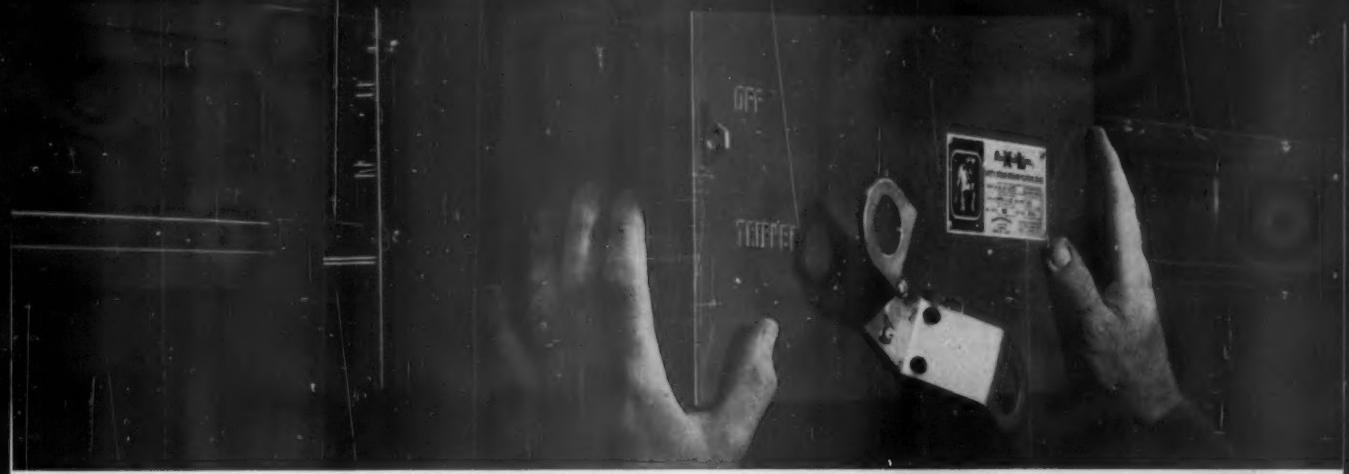
### Electronic Set-up Matches Colors Quickly and Accurately

Delivery time on colored plastic molding compounds at the Monsanto Chemical Co., Springfield, Mass., is sharply reduced with electronic color-matching. The G.E. spectrophotometer analyzes production samples and assigns mathematical values to hue, purity, and value. These are compared to a standard color by Davidson & Hemmendinger computer which automatically corrects for variable sensitivity of the eye. Procedure eliminates time-consuming customer verification and approval of trial matches.

Write No. 400 on Inquiry Card—Page 34

For More Information about ad on facing page  
Write No. 401 on Inquiry Card—page 34→

PURCHASING



**NEW BULLDOG XL BUSTRIBUTION DUCT...**

# **3 WAYS SAFER FOR PEOPLE AND PROPERTY**



HERE'S THE FIRST DEAD-FRONT plug-in duct. Butyl insulation covers the full length of each silvered aluminum bus bar, *even in bus plug openings*. You get positive protection for personnel against accidental contact with "live" bars.

PLUG-IN SAFETY DOOR IS ALWAYS CLOSED during installation of XL Safety Plug. Interlock finger positively prevents plug installation or removal when Safety Door is open . . . and it keeps door from closing against "live" plug fingers.

THERE'S NO ARCING to endanger people or property . . . you can't plug in or unplug when the switch is "ON."

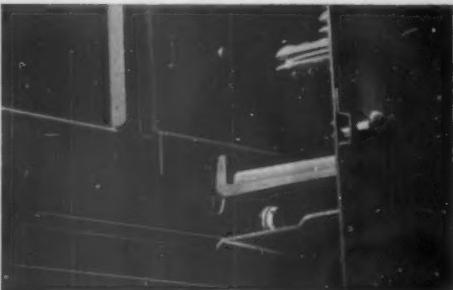
New XL BUStribution® Duct cuts down installation time . . . takes less space . . . reduces duct weight on building structure as much as 40%. Keyed bus ends slip together in a hurry while a single integral bolt locks joints securely under a ton of pressure.

Ask your BullDog distributor to arrange for a demonstration. You'll see how fast-to-install XL BUStribution Duct and matching Safety Plugs really are!

BullDog Electric Products Division, I-T-E Circuit Breaker Company, Box 177, Detroit 32, Michigan. In Canada: 80 Clayton Rd., Toronto 15, Ont. Export Division: 13 East 40th St., New York 16, N. Y.



**IT'S TRUE DEAD-FRONT.**  
Each silvered aluminum bus bar is full-length insulated with Butyl envelope.



**IT'S A SAFETY DOOR.** You can't plug in or unplug with the door open, can't close door on "live" plug fingers.



**IT'S A SAFETY PLUG.** You can't plug in or unplug against a load . . . safeguards personnel and equipment against arcing.



**BULLDOG ELECTRIC PRODUCTS DIVISION**  
**I-T-E CIRCUIT BREAKER COMPANY**



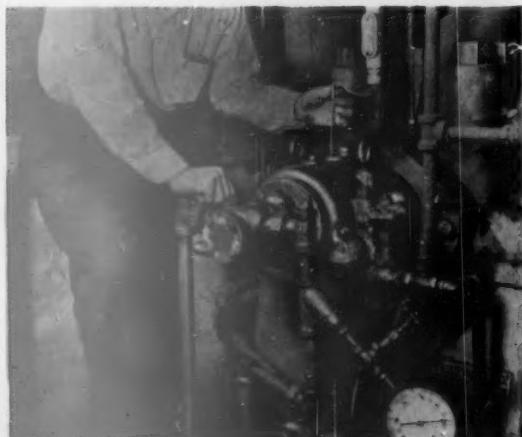
## Electrical Equipment



### Electric-Eye Line Tracer Pays For Its Original Cost Within a Year

Installation of an electric-eye line tracer on an automatic multi-torch flame cutting machine will pay for itself within a year at Drott Manufacturing Corp., Wausau, Wis. The tracer, made by Chemetron Corp., has increased machine productivity 15%. It follows a pencil drawing rather than the profile of the steel strip previously used which were awkward, costly, and required almost modification. The "paper templates" are easier to make and handle, and save time and material.

Write No. 476 on Inquiry Card—Page 34



### Thermistor System for Monitoring Bearing Overheat Saves \$40,000

Savings of \$40,000 a year are expected with an 84-point thermistor monitoring system for detecting bearing overheat and incipient damage in powerhouse equipment at Allied Chemical Corporation's Buffalo, N.Y., plant. Reduced cooling water consumption, increased lube oil life, and reassignment of personnel previously required are the advantages of the Fenwal detection units wired to an alarm system. The automatic system picks up potential trouble much earlier than by touch.

Write No. 477 on Inquiry Card—Page 34



### Junction Boxes Mounted Easily on Masonry Walls

A leading manufacturer saved money by attaching electrical junction boxes to masonry walls with Permacel Junction Box Mount PA-1041. The compartmented cup allows resin and hardener to remain separated until ready for actual use. Previously, the company used toggle bolts or plugs which involved the laborious and hazardous use of a star drill. When fully cured, the strength of the bond between box and wall is greater than the strength of the wall itself.

Write No. 478 on Inquiry Card—Page 34

For More Information about ad on facing page

Write No. 479 on Inquiry Card—page 34

PURCHASING

# THERE'S A REAL DIFFERENCE IN SAFETY-SWITCH SAFETY!



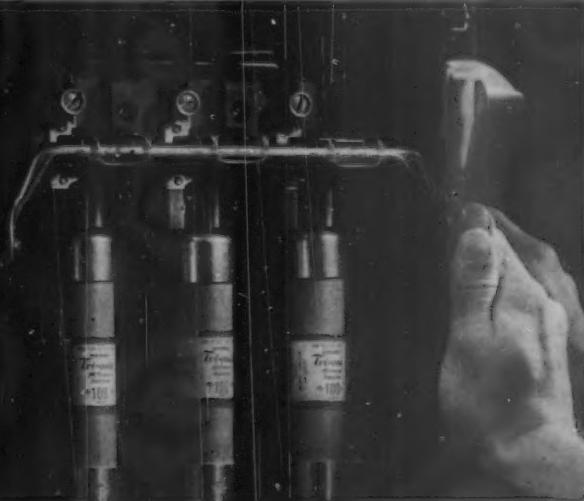
The *real* difference in safety . . . and the difference is *very* real . . . lies in switch performance under electrical load. You can spot this difference instantly when you compare the action of BullDog Vacu-Break® Safety Switches.

When you operate Vacu-Break Safety Switches under load, there is no blinding flash, no dangerous arc "explosion". The exclusive Vacu-Break design double-breaks the circuit, confines the arc within the enclosed switch head, smothers and extinguishes it instantly. Maintenance of contact points is virtually eliminated, and you don't have to open the switch-box door to know the contact is broken.

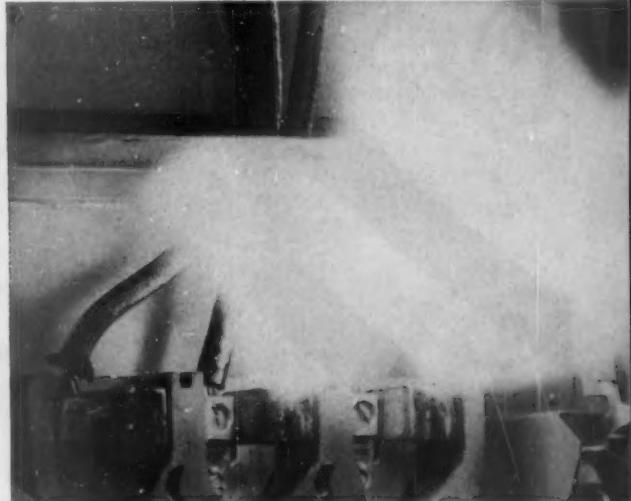
The **operating handle** is connected directly to the Vacu-Break heads. Push the handle "Off" and contact is broken positively every time. There are no toggles, triggers or springs to depend on. You know the switch is "Off" without looking.

**Clampmatic® assembly** gives clamped pressure contact, speeds "break". This means positive, safe operation, and long, trouble-free switch life. In safety switches, the *real* difference in safety lies in design and performance. Compare BullDog Vacu-Break Safety Switches with other types, and then see the difference!

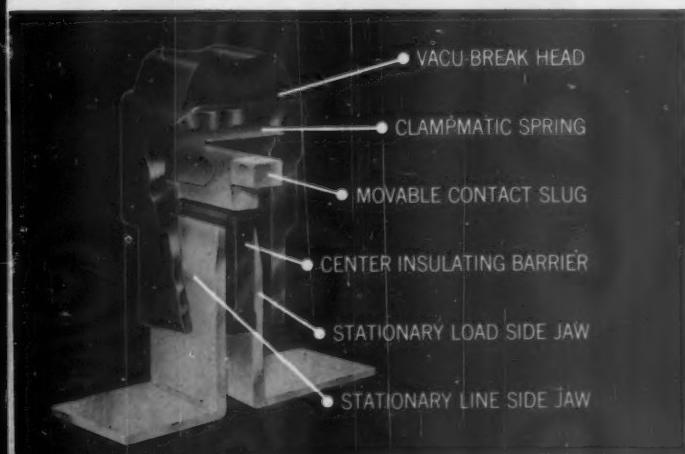
Unretouched photographs of the arc in 100-Amp 600-volt switches operating under 90-Amp 440-volt load with 40% to 50% power factor. Pictures taken at instant of break.



Vacu-Break Safety Switches confine dangerous, destructive arcs inside arc chambers, and smother them instantly.



Open knifeblade switches permit arc "explosions", burning and pitting contact points. The result—fire hazard and switch damage.



Cutaway of Vacu-Break switch head, showing movable contact slug inside arc-smothering closed chamber. Clampmatic spring assembly gives bolt-tight contact, speeds "break", increases switch life.

BullDog Electric Products Division, I-T-E Circuit Breaker Company, Box 177, Detroit 32, Michigan. In Canada: 80 Clayson Rd., Toronto, Ont. Export Division: 13 East 40th St., New York 16, N.Y.

For Safety's Sake—Buy Vacu-Break



**BULLDOG ELECTRIC PRODUCTS DIVISION**  
**I-T-E CIRCUIT BREAKER COMPANY**

®

## MAJOR MERGER IN SWITCH INDUSTRY

Controls Company of America  
Merges Hetherington Div. With  
Electrosnap Corp. to form  
New Control Switch Division.

One of the precision switch industry's most complete product lines has come into existence with the announcement by Louis Putze, President of Controls Company of America, Schiller Park, Ill., that its subsidiary Hetherington, Inc., has been merged with Electrosnap Corporation, Chicago. The merger was recently completed.

"This merger is important to switch users", Mr. Putze stated, "because it combines two major manufacturers of switches."



Basic Snap-Action Switches



Limit Switches



Toggle Switches



Push-Button Switches



Indicator Lights

# **what's in it for you?**

**New expanded line from a single convenient source.**

**Increased R & D and technical assistance.**

**More localized distribution and service.**

Now, you may select from the industry's most versatile and complete line of precision snap-action switches, indicator lights, push-button switches, Switchlites, and environment-free limit switches. You can now make broader product groupings for greater quantity discounts. With this new single source, you will now deal with just one sales engineer for all your switch needs.

Three plant locations—Folcroft, Pa., Chicago, Ill., and El Segundo, Calif.—will provide regional engineering and manufacturing facilities to speed delivery and service.

You will benefit from the combination of military and commercial experience in our new, expanded R & D facilities. Many revolutionary new products are under development in such areas as human factors, sub-sub-miniaturization, image displays, and controls for special environments.

Local sales offices with factory-trained personnel have been set up to provide on-the-spot application engineering. An expanded nation-wide distributor organization will assure you of immediate delivery from local sources.

Now, how can we serve you today?

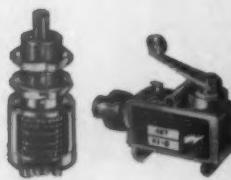
## **ELECTROSNAP HETHERINGTON**

## **CONTROL SWITCH** DIVISION

CONTROLS COMPANY OF AMERICA  
4218 W. Lake Street • Chicago 24, Illinois  
Telephone: VAn Buren 6-3100 • TWX No. CG-1400



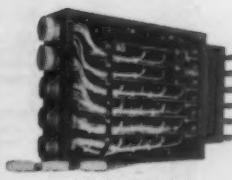
Lighted Push-Button Switches



Environment-Free and  
Hermetically-Sealed Switches



Miniaturized  
Switches



Special Switches  
and Panel Components

For More Information Write No. 480 on Inquiry Card—Page 34

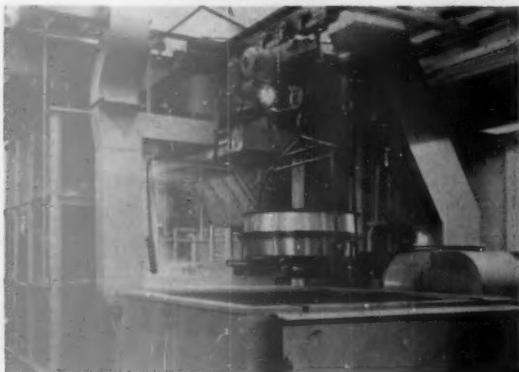
## Electrical Equipment



### Combination Welder Replaces Two Machines, Costs Under \$200 to Run

P&H DA-200 combination welders cost less than \$200 a year to operate at Douglas Aircraft Company, Inc., Santa Monica, Calif. The operation changes over from one type of current to the other with the turn of a switch, thereby saving time at least once on every part welded. In addition, the AC-DC unit has single phase operation, requiring only 230/460 volt, 50/60 cycle current. Formerly two separate machines were required to do the job.

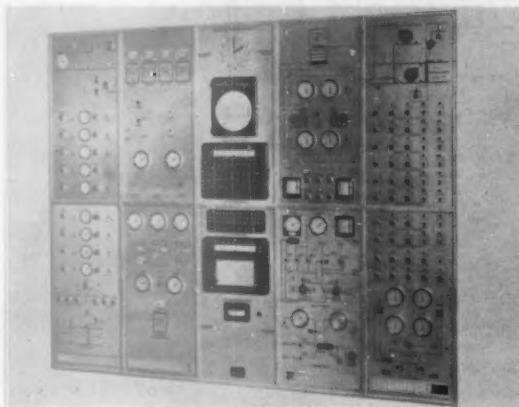
Write No. 415 on Inquiry Card—Page 34



### Radio Controlled Phosphating Line Saves Over \$4000 in Five Years

A radio controlled automatic phosphating line paid for itself and made a savings of \$4000 in its first five years of operation at Timken Roller Bearing Company. Production has also increased substantially because much of the work was not phosphated previously. Now the work that used to be done in three shifts is done in one and a half shifts. Many small parts, the big mill bearings, and all of the purpose bearings are run on the same line.

Write No. 416 on Inquiry Card—Page 34

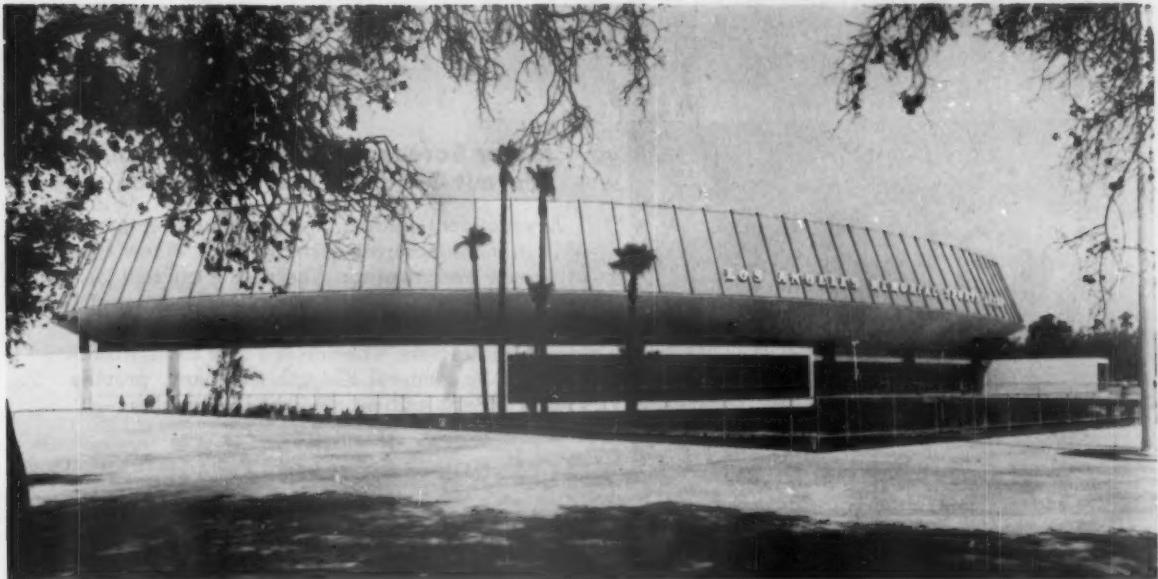


### Mixing Boxes Coordinate 301 Air Conditioning Zones With Less Noise

A new building constructed by the California Division of Highways has 301 air conditioning zones with air supplied at high velocity to Barber-Colman CVO constant volume mixing boxes. Its old building, on the other hand, is controlled by a ten zone air conditioning system. The mixing boxes provide the advantages of tempering the zone supply air, maintaining the required volume, and diluting fan noises to maintain quiet office areas.

Write No. 417 on Inquiry Card—Page 34

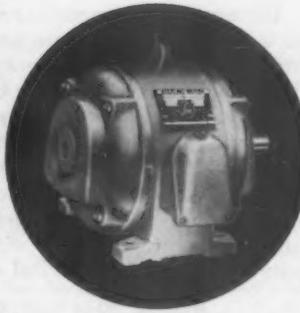
# FOR THE NATION'S MOST MODERN SPORTS ARENA... MODERN ELECTRIC MOTORS BY STERLING!



Equally suitable for sports events or convention meetings, the Los Angeles Memorial Sports Arena, site of the 1960 Democratic National Convention, is one of the nation's newest and largest public assembly buildings. Designed by Welton Becket and Associates, architects and engineers, for the Los Angeles Coliseum Commission, the Arena can accommodate up to 22,400 seats, depending upon the type of event being held.

Because comfort is a vital factor in the use of the Sports Arena, every effort was made to insure that the air conditioning throughout the building would be unequalled in efficiency. Three basic air handling systems and two piping systems provide the necessary flexibility for the many variations in air conditioning loads that are required.

54 STERLING Electric Motors were selected to power the pumps, fans and air handling units. These alternating current, squirrel cage, drip-proof Sterling drives, ranging from 1 hp to 75 hp, provide quiet and dependable service...service that has made Sterling the name to remember for modern electric drives.



## Only STERLING Multi-Shielded A.C. squirrel cage motors provide all these advantages:

- Patented herringbone rotor assures quiet operation.
- Splash resistant enclosure provides many times the protection required by NEMA standards...protects against dripping liquids and falling objects.
- Sterling Multi-Shielded protection also incorporates sealed leads and terminal box, double-shielded pre-lubricated ball bearings and labyrinth seal on output shaft...for long, trouble-free service life.
- Direct through ventilation results in cooler motor operation and prevents overheating.
- Mechanical and electrical modifications are available for virtually any special application.

For additional information about the unmatched advantages of Sterling Multi-Shielded Motors for your application, write for free copy of Bulletin 194.



# STERLING

ELECTRIC MOTORS, Inc.

5401 TELEGRAPH ROAD • LOS ANGELES 22, CALIFORNIA

Offices and stocks in all principal cities. Over 400 distributors throughout the country to serve you.

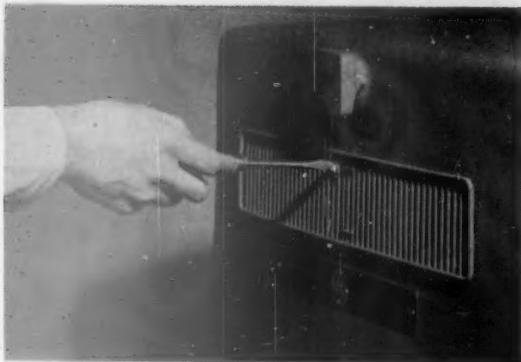


For More Information Write No. 481 on Inquiry Card—Page 34

MAY 23, 1960

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## Electrical Equipment



### Motor Screens Provide Protection, Permit Greater Plant Production

A prominent midwestern manufacturer saved 50% in manufacturing costs by using a new type of screen over medium alternating current motors. Previously, the company had used perforated metals and fabricated rubber edgings to screen the motors. The screens now used, manufactured by General Electric Company, provide greater safety and permit more production.

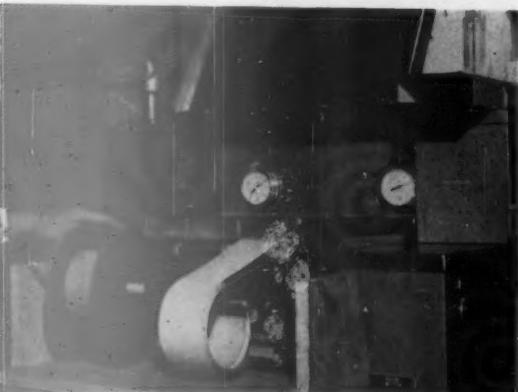
Write No. 482 on Inquiry Card—Page 34



### Ultrasonic Gages Save Measuring Time, Provide Closer Tolerances

Ultrasonic equipment has reduced from a week to a few hours the time necessary to gage reinforced plastic nose cones and radomes at Brunswick-Blake-Collender Co., Marion, Va. Two Vidigage ultrasonic resonance gages also hold the products to closer tolerances than before. Formerly, separate checking fixtures had to be built for each different component. Now thickness is read directly on a calibrated scale with the accuracy of a micrometer, without removing the nose cone from its mandrel or mold.

Write No. 483 on Inquiry Card—Page 34



### X-Ray Processor Recovers Cost In 2 Years While Boosting Output

X-ray operating costs were halved at ACF Industries, Milton, Penna. with the Kodak industrial X-omat processor. Anticipated savings in materials and labor are expected to pay for the initial outlay within two years. The time for processing film has been reduced from 90 to 12 minutes, permitting simultaneous inspection and output and eliminating bottlenecks in the inspecting department. X-ray film costs have been reduced more than 50% and the company is getting better radiographs.

Write No. 484 on Inquiry Card—Page 34



**Immediate Local Deliveries**  
for small runs, production  
emergencies or design needs . . .  
from over 30 strategically located  
parts distributors . . . At factory  
prices in lots up to 1000 of a value.

**Would you buy  
fixed resistors  
just because they're the  
easiest to solder?**

***Of course you wouldn't!***

But when you add the highest degree of "solderability" of any resistors on the market to top-notch reliability in other physical and electrical characteristics — well, that's something else. Like a lot of other cost-conscious producers, you'll then be using Stackpole Coldite 70+ Resistors!

Stackpole Coldite 70+ "solderability" saves time and money in your production. It assures perfect connections that eliminate a lot of possibilities for costly field service later on.

Coldite 70+ performance fully matches the "solderability" of the leads. They're designed to meet or excel MIL-R-11 in every respect. And they're tops in load life, humidity and moisture tests!

Electronic Components Div.—STACKPOLE CARBON CO., St. Marys, Pa.



**STACKPOLE**  
*Coldite 70+*  
fixed composition resistors

CERAMAG® FERRITE CORES • VARIABLE COMPOSITION RESISTORS • SLIDE & SNAP  
SWITCHES • CERAMAGNETO CERAMIC MAGNETS • FIXED COMPOSITION CAPACITORS  
BRUSHES FOR ALL ROTATING ELECTRICAL EQUIPMENT • ELECTRICAL CONTACTS  
GRAPHITE BEARINGS, SEAL RINGS, ANODES • HUNDREDS OF RELATED CARBON &  
GRAPHITE PRODUCTS.

ACTUAL X-RAY PHOTO\*  
OF TRI-CLAD® '55'  
 $7\frac{1}{2}$  HP MOTOR

Shaft →

Windings

Conduit  
Box

New Thermo-Tector® System  
Eliminates Overload Burnouts

Rotary →

Motor  
and  
Thermo-  
Tector  
Leads

Endshield →

Bearing

GENERAL  ELECTRIC

# Exclusive General Electric Thermo-Tector<sup>†</sup> System Eliminates Overload Burnouts

**ALLOWS MAXIMUM  
MOTOR OUTPUT—  
SAFELY!**

Now—Tri-Clad '55' motors have simple, direct-acting thermal protectors that positively prevent overload failures!

New Thermo-Tector heat-sensing switches buried in motor windings react instantly to prevent heat damage. Unique Thermo-Tector "anticipation" feature varies motor shutoff point according to rate of winding heat rise. This ends need for operating safety margin, allows you to get full output from Tri-Clad '55' motors.

Thermo-Tector system requires no costly amplifying relays—works with any conventional G-E motor controller. Thermo-Tector protection is available on all Tri-Clad '55' motors in frames 254U-445U.

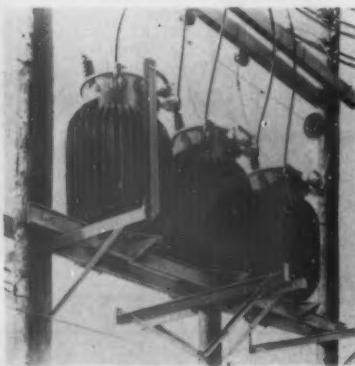
For more information, contact your General Electric Apparatus Sales Office or write for Bulletin GEA-7092, Section 866-01, Schenectady 5, New York.

\*Photo made from radiograph taken with 1,000,000-volt G-E Resistor® X-ray machine at General Electric's Large Steam Turbine-Generator Department.

†Trade-mark of General Electric Company.

SMALL AC MOTOR & GENERATOR DEPT.  
**GENERAL ELECTRIC**  
SCHENECTADY 5, NEW YORK

## Powerful Transformers Fit Into Existing Space



Houston Lighting and Power Company replaced three 100-kva units with three 333-kva, 7200-volt distribution transformers in the same space. The transformers, built by Westinghouse Electric Corporation, were placed on the existing 14-foot rack in the alley behind the plant. The rack didn't have to be modified because each unit is about 35 inches in diameter and 57 inches high.

Write No. 676 on Inquiry Card—Page 34

## 85% Savings Made by Switching to Forging



The cost of producing overspeed limiting devices for large motor-generators was cut 85% at General Electric by switching from a two-piece assembly to a die-pressed forging. The original part consisted of an arm brazed to a brass casting which had to be machined, slotted, and drilled. Almost all machining is eliminated now with the Anaconda forging because of its improved finish and consistent dimensional accuracy.

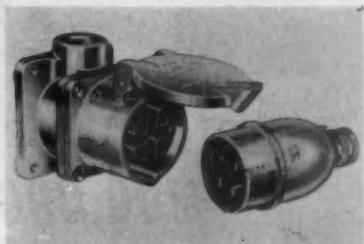
Write No. 677 on Inquiry Card—Page 34

## Electrical Connector Gives More Flexibility

Greater flexibility and a 35% cost savings are the results of substituting a circuit breaking electrical connector for standard safety switches at the Caterpillar

For More Information Write No. 486  
on Inquiry Card—Page 34

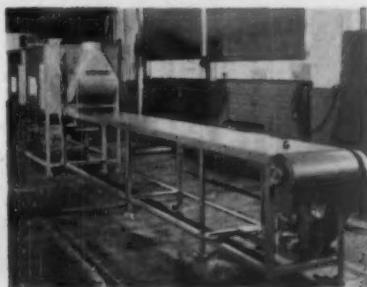
Tractor Co. plant, Aurora, Ill. Maintenance has been eased because the QuelArc connector provides equal weather-resistance with less weight. Partitions be-



tween the male contacts increase the length of insulating surfaces to prevent arcing from pole to pole and from poles to ground.

Write No. 678 on Inquiry Card—Page 34

## Dielectric Oven Replaces Eight Hot Air Units



A large southern sugar processor is using a 100-kw dielectric heater built by Allis-Chalmers to replace eight manually operated hot air ovens. The dielectric drying oven occupies the same space as the previous method and offers cost and time savings. Actual drying time is cut to less than a minute and the unit has a capacity in excess of 100,000 cubes an hour.

Write No. 679 on Inquiry Card—Page 34

## For a Complete Report

on the 45th Annual

N.A.P.A. Convention

Don't miss the

June 20th Issue of

**PURCHASING Magazine**

# NOW! Fuses that...

*Safely interrupt fault currents up to  
200,000 amperes...*

*Limit fault current to very low values*  
*Hold 500% load for minimum of ten seconds*

Buss Low Peak fuses can completely revolutionize the protection of the entire electrical system.

Protect Mains, Feeders, Branch Circuits, Motors, Controllers, Switches—no matter whether the fault current is 1,000 amperes, 25,000, 100,000—or as high as 200,000 amperes.

Reduce stresses and prevent damage to Panel-boards, Switches, Motor Controllers—other circuit components—because let-thru fault currents are limited to exceptionally low values.

Prevent work stoppages, lights out, waste of time and money—because long time-lag keeps them from opening needlessly on motor starting currents or other harmless overloads.

Permit increasing interrupting capacity and current limitation on present system at minimum cost.

*Before designing a new installation—  
or modernizing old installations—*

## **GET ALL THE FACTS**



Knowledge without action is of little value—but ACTION NOW may save you money—increase operating efficiency and reduce electrical hazards to a minimum.

BUSS LOW-PEAK fuses fit standard Switches and Panel-boards and are available in N.E.C. sizes from 15 to 600 amperes in both 250 and 600 volt ranges.

Write for BUSS LOW-PEAK Bulletin Now... or use coupon.

**Bussmann Mfg. Division**  
McGraw-Edison Co.  
St. Louis 7, Mo.

# BUSS Low-Peak FUSES



Bussmann Mfg. Division, McGraw-Edison Co.

University at Jefferson, St. Louis 7, Mo.

Please send BUSS Low-Peak Fuse Bulletin LPS.

Name.....

Title.....

Company.....

Address..... City..... State.....

PU-550

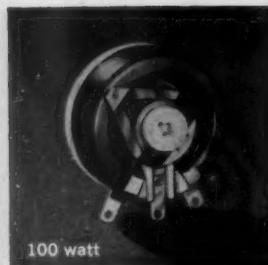
For More Information Write No. 487 on Inquiry Card—Page 34

MAY 23, 1960

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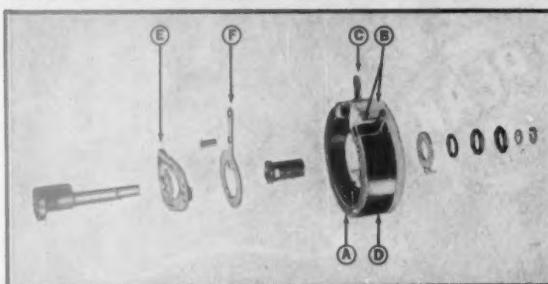
25 watt



100 watt



300 watt



**THIS IS A RHEOSTAT  
YOU CAN STAKE YOUR  
REPUTATION ON**

**From 25 to 300 watts these VITROHM ring rheostats  
are engineered for longest life, maximum reliability**

To be sure about smooth, trouble-free control in the 25- to 300-watt range—just specify a VITROHM rheostat.

You get smooth control: Close-laid turns (A) of special wire or ribbon insure smooth gradual resistance change from zero to maximum.

You get reliability: VITROHM rheostats are engineered for permanence from ceramic base and core (B) to durable terminals (C), to final long-lasting VITROHM bonding (D).

You get positive action: Self-lubricating twin-shoe contacts—exclusive with W/L—on balanced contact arm (E) eliminate backlash, minimize wear, assure positive contact to collector ring (F).

Check all the features in W/L Bulletin 60RR (and for ratings above 300 watts, check Bulletin 60A). Write Ward Leonard Electric Co., 50 South Street, Mount Vernon, N.Y. (In Canada: Ward Leonard of Canada, Ltd., Toronto.)



**WARD LEONARD**  
ELECTRIC COMPANY • MOUNT VERNON, N.Y.

Result-Engineered  
Controls Since 1892



RESISTORS



RHEOSTATS



RELAYS



CONTROLS

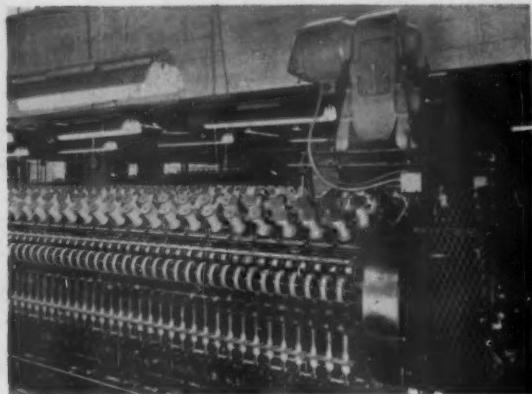


DIMMERS

**Write for list of stocking distributors.**

For More Information Write No. 488 on Inquiry Card—Page 34

**Variable Speed Drives  
Increase Production 25%**



When the Jantzen Knitting Mills installed Sterling variable speed drives on their ring spinning frames, production went up from 25 to 30%. In addition, infinitely variable speed variation makes wider variety of work possible. Down-time and maintenance costs have been reduced because speed of drives can be changed while equipment is running to compensate for type of material and changing atmospheric conditions.

Write No. 680 on Inquiry Card—Page 34

**Railroad Saves \$32,700 in Year  
With Electric Tractors**

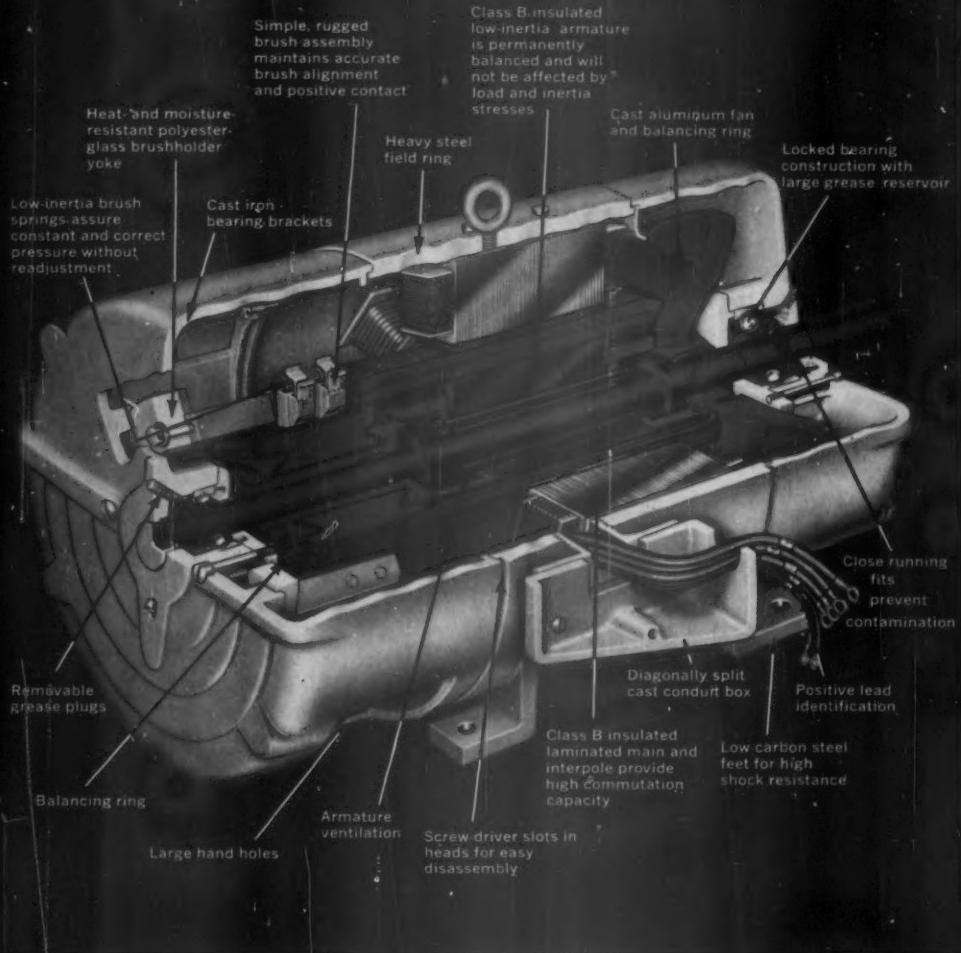


Electric tractors manufactured by the Automatic Transportation Co. have saved the Boston and Maine Railroad \$32,700 in a year's time. Compared to equipment formerly used, operating and maintenance costs were reduced by 50% on fuel, 75% on parts, and 60% on labor. Where six to eight men were needed to service a fleet of gasoline tractors, only three men are needed to maintain the electrics.

Write No. 681 on Inquiry Card—Page 34

For More Information about ad on facing page  
Write No. 489 on Inquiry Card—page 34→

Here's the latest in D-C motor design:



...and some  
easy-to-add  
field  
modifications



A-c tachometer for speed indication



A-c motor-driven blower with permanent dry-type filter for easy mounting on bearing bracket



Magnetic disc-type brake with d-c series or shunt, or a-c coils



Helical single, double, and triple reduction gear units for all ratios

## New Louis Allis FLEXITORQ® D-C MOTORS

...offer you vastly improved commutation—low brush wear—  
400% short-time overload capacity—and unmatched flexibility!

Bear this in mind: The Flexitorq is *not* just another rerated d-c motor. It's *all new*—and it's been designed to give you more for your power dollar—in superior performance, matchless field flexibility, and unrivaled economy of operation and upkeep.

Advanced armature design and brush construction offers improved commutation, faster response, and lower brush wear. Class B insulation system provides exceptional thermal endurance... is rated for 60°C rise for continuous duty... and creates a barrier to moisture, acids, alkalies, and other contamination.

The net result to you is reliable, trouble-free power for constant and adjustable speed drives. For example, Flexitorq gives you 400% faster acceleration, plus much better deceleration, reversing, and speed changing. You can safely impose 400% intermittent and 15%

continuous overloads—and the high-torque design is a welcome plus when you need extra power for hard-to-start machines.

The new Louis Allis Flexitorq is lighter and more compact than previous d-c motors... lets you squeeze more power into less space... yet is actually easier to service! Brushes and entire brush-holder assemblies can be quickly inspected and removed without major disassembly. And since brush springs remain conveniently attached to the brush holders, brush changing is a simple affair.

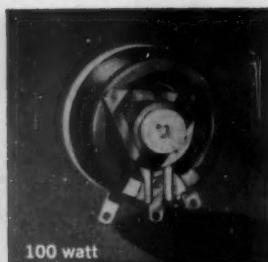
Flexitorq d-c motors are available in sizes from 1 to 400 hp—in various enclosures. See your nearby Louis Allis District Office for information and application help. Or write for Bulletins 3150 and 3200 to The Louis Allis Co., 439 E. Stewart St., Milwaukee 1, Wis.



**LOUIS ALLIS**



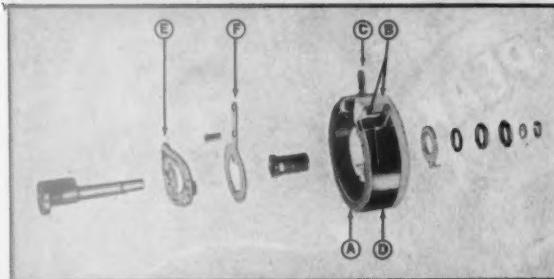
25 watt



100 watt



300 watt



**THIS IS A RHEOSTAT  
YOU CAN STAKE YOUR  
REPUTATION ON**

**From 25 to 300 watts these VITROHM ring rheostats  
are engineered for longest life, maximum reliability**

To be sure about smooth, trouble-free control in the 25- to 300-watt range—just specify a VITROHM rheostat.

You get smooth control: Close-laid turns (A) of special wire or ribbon insure smooth gradual resistance change from zero to maximum.

You get reliability: VITROHM rheostats are engineered for permanence from ceramic base and core (B) to durable terminals (C), to final long-lasting VITROHM bonding (D).

You get positive action: Self-lubricating twin-shoe contacts—exclusive with W/L—on balanced contact arm (E) eliminate backlash, minimize wear, assure positive contact to collector ring (F).

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**WARD LEONARD**

ELECTRIC COMPANY • MOUNT VERNON, N.Y.

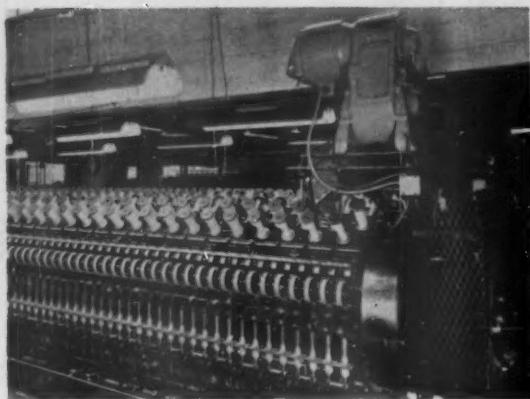
**Reliably Engineered  
Controls Since 1892**



**Write for list of stocking distributors.**

For More Information Write No. 488 on Inquiry Card—Page 34

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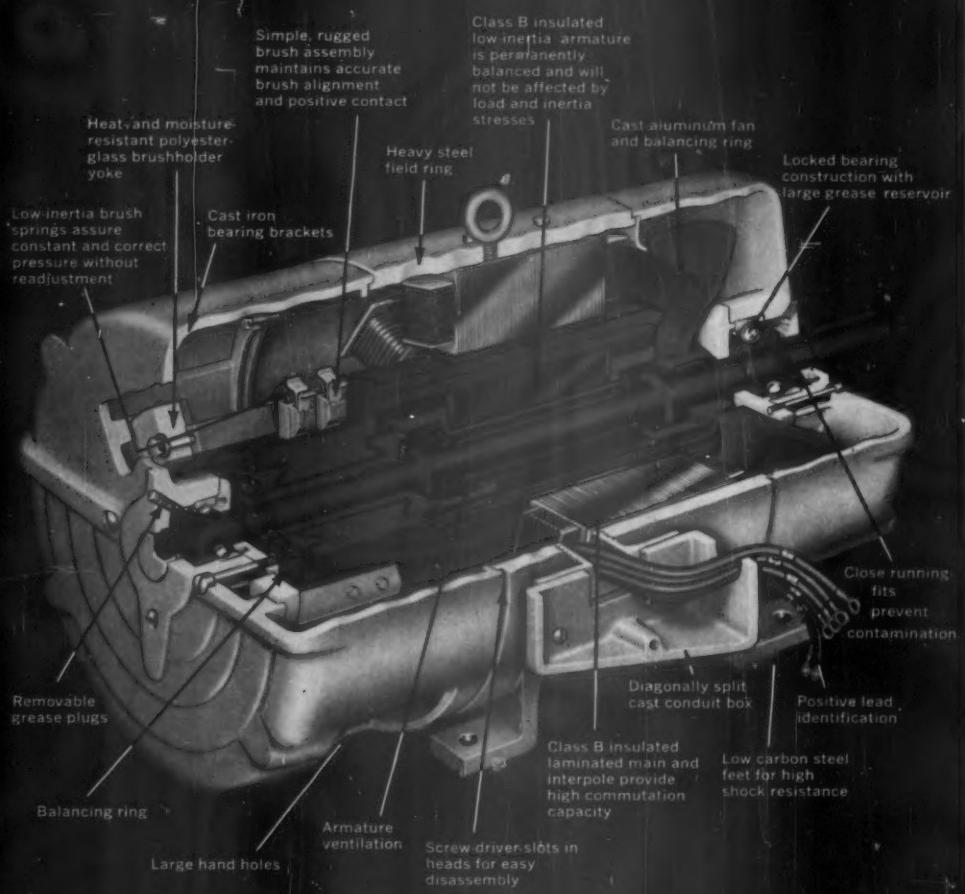


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**LOUIS ALLIS**

**Automatic Welding Cuts  
Fabricating Time 33%**

By switching to automatic Unionmelt welding to fabricate connecting rods for giant drawworks equipment, a southwestern steel company produces higher-quality welds in less than 1/3 the time. Previously it had used the covered-electrode welding process. Now a connecting rod is completed in less than 11 hours. The welds need no between-pass treatment as the operator easily knocks



off the fused flux without any delay.

Write No. 683 on Inquiry Card—Page 34

**Automatic Flame Cutting  
Shapes Steel 10% Quicker**



An optical lofting and automatic flame cutting system enables Sun Shipbuilding and Dry Dock Company, Chester Pa. to shape steel plates in 1/10 the time of the old system. The "brains" behind the system are Kodalith Ortho Plates—tiny photo templates. A photo-electric light beam follows the negative lines and guides the cutting flames. Savings from the storage yard to the finished burned plate are 50%. The templates are easy to file, eliminating the storage of bulky wooden templates.

Write No. 684 on Inquiry Card—Page 34

We take pleasure in announcing that

**H. W. CHRISTENSEN**

FORMER CHIEF PURCHASING EXECUTIVE  
UNITED STATES STEEL CORPORATION, COLUMBIA GENEVA DIVISION

1959 Recipient J. SHIPMAN GOLD MEDAL AWARD

FORMER PRESIDENT, N. A. P. A.

Will become associated with our company effective June 1

AS

EXECUTIVE VICE PRESIDENT—COMMERCIAL

**FISCHBACH AND MOORE**

INCORPORATED

ELECTRICAL CONTRACTORS

545 MADISON AVENUE, NEW YORK 22, N. Y.

ATLANTA • CHICAGO • DALLAS • DENVER • DETROIT • GARY-EAST CHICAGO

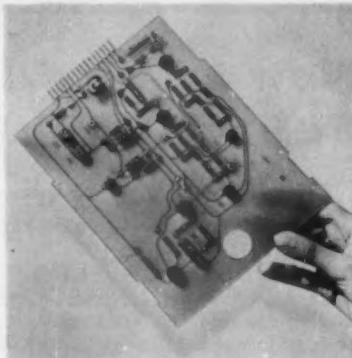
GULFPORT • HOUSTON • LOS ANGELES • MIAMI • ORLANDO

PITTSBURGH • SAN DIEGO • SAN FRANCISCO • SEATTLE • WASHINGTON, D. C.

In Canada: FISCHBACH AND MOORE OF CANADA, LTD., MONTREAL • TORONTO

For More Information Write No. 490 on Inquiry Card—Page 34

**Circuit Panel Assembly  
Costs Reduced 30%-50%**



Printed circuit panel assembly costs were cut 30% to 50% with glass-epoxy copper-clad plastic laminate panels at the plant of HRB-Singer, Inc., State College, Pa. The material, made by Taylor Fibre Co., combines high strength with extremely low water absorption characteristics and good electrical properties. Its insulation resistance is also above average.

Write No. 685 on Inquiry Card—Page 34

**PURCHASING**



# BRUSHES

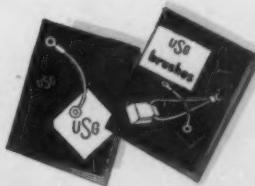
**help give BLACK & DECKER  
INDUSTRIAL TOOLS  
power, long life,  
maintenance-free service**



For more than forty years Black & Decker electric tools have been recognized by users as the most dependable and adequate tools of their kind. This reputation has been earned through rigid quality control, intensive research, testing and design engineering. To help make these tools first in performance and quality the world over, Black & Decker specify USG motor brushes. (Some of the industrial electric tool applications are pictured here.)

United States Graphite Company (USG) brushes are giving excellent service not only in Black & Decker products, but also in hundreds of installations, large and small, throughout industry. Because the brushes in any electric powered unit are so vital to the long life, power and maintenance-free service of that unit, it pays to specify USG brushes of carbon, carbon-graphite, electro-graphite, graphite, metal graphite or silver graphite.

Write for catalog B-56 and the USG grade list. Most of the information necessary to design engineers is contained in these two books.



B-246-1

**THE UNITED STATES GRAPHITE COMPANY**  
DIVISION OF THE WICKES CORPORATION, SAGINAW 15, MICHIGAN

**GRAPHITAR® CARBON-GRAFITE • GRAMIX® POWDER METALLURGY • MEXICAN® GRAPHITE PRODUCTS • USG® BRUSHES**

For More Information Write No. 491 on Inquiry Card—Page 34

For More Information about ad on following page Write No. 492 on Inquiry Card—pg. 343



A REPORT FROM ALCOA



# To the purchasing agent who must decide on **COPPER WIRE AND CABLE**

**How one p.a. solved an emergency in 63 hours by  
knowing his cable facts:**

One Friday afternoon, a manufacturer in Seattle suddenly had an equipment breakdown. He needed 500 feet of 5-KV copper cable *fast*.

At 5:05 he caught his Rome representative just leaving the office. Rome man called his home office in Rome, N. Y. By 11:00 that night the order had been assembled from Rome's stock. By 7:30 Monday morning the cable was *in Seattle and on the job!*

This was a case of a purchaser who knew what he needed to know about buying copper wire and cable.

1. He knew where to turn when he needed *service* that might cause other suppliers to pale.
2. He also knew that *availability* is rarely a problem, because of Rome's stocking program and network of 500 distributors.
3. He knew of Rome's *delivery* plan—close teamwork that puts every foot of cable where it's needed, when it's needed.
4. And he knew that Rome's *prices* are competitive.

#### Your turn next?

Next time you are asked to buy wire and cable, be sure you have all the facts at your finger tips—and a supplier who comes through with the goods.

Talk it over with your Rome Cable distributor now. Or write us for Bulletin RCP 100, "Guide to Representative Wire, Cable and Conduit." Rome Cable Division of Alcoa, Dept. 14-40, Rome, N. Y.

#### NOW YOU CAN GET ALL 4 FROM ROME



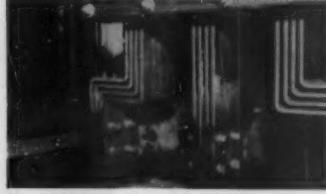
Copper wire and cable



Aluminum wire and cable



Aluminum conduit



Aluminum bus conductor

**ROME CABLE  
DIVISION OF ALCOA**

*Kling*

1400 S. ILL. U.S.A.



## THE MAN & THE MOTORS





## Mr. Westinghouse\* brings Kling Bros. Engineering modified Life-Line A motor to replace expensive shop-built drive

To meet the demanding requirements of a motor for their high inertia friction saws, Kling Brothers Engineering Works had been forced to fabricate their own motor frames, brackets and shafts. Balancing was also done in their shop to meet the exacting mechanical tolerances.

The Kling saw uses the motor shaft as the spindle head with the motor mounted on a special base located on their machine. Mounting tolerances must be held to 0.001".

When Kling called in Mr. Westinghouse, he suggested some modifications to the standard Life-Line® "A" motor to meet all their requirements. One compact unit now serves their needs . . . at much less cost than their handmade drives.

The Westinghouse Life-Line "A" motors feature a pull-out torque of 350 to 400%. To accommodate the high radial thrust, oversize bearings and shafts are used. Locked bearings limit any end play of shaft. A tapered shaft permits the saw blade to be mounted directly on the motor. A coordinated balancing program at Buffalo (with motor alone) and the Chicago area M & R shop (complete with blade) assures perfect performance of the finished machine.

Mr. Westinghouse can help you with *your* drive needs whether they are standard or special. You can depend upon him to give you peak performance just as he did at Kling.

\*Ralph Recka, Westinghouse Sales Engineer in Chicago.

# FROM WESTINGHOUSE



## Mr. Westinghouse\* and the Life-Line A motor brought 56,940 hours' continuous service in highly corrosive atmosphere to Allied Chemical's General Chemical Division

When General Chemical called in their Westinghouse sales engineer back in 1953, they had a serious drive problem. An electric motor was required for 24-hour service in an atmosphere containing hydrogen chloride, sulphur dioxide and sulphur trioxide. Ambient conditions varied from 70° to 100°F.

A Westinghouse Life-Line "A" Type TEFC motor was selected to power a screw conveyer that feeds raw material at the rate of seven tons every 24 hours, 365 days per year, from storage hoppers. A motor breakdown would result in a two-hour shutdown of the equipment it serves.

After more than 6½ years of 'round-the-clock operation, this Westinghouse Life-Line "A" motor is still giving trouble-free service under very severe operating conditions. Such a record indicates many more years of outstanding service.

Mr. Westinghouse is well equipped to step in and help you solve *your* drive problem . . . just as he did at General Chemical Corporation.

\*Tom G. Broussard, Westinghouse Sales Engineer in Philadelphia.

J-22156-R

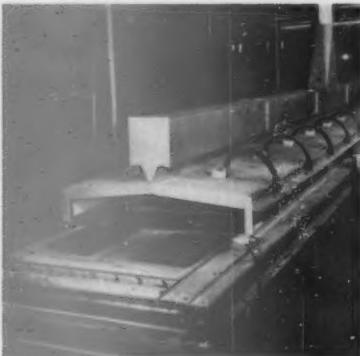
Call in The Man from Westinghouse when you need help on your electrical drive requirements. He's well equipped to supply motors from fractional hp to hundreds of "horses." And he'll show you how to save money . . . whether it's a shelf

item or a custom-engineered motor you need. For additional information write: Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

**YOU CAN BE SURE...IF IT'S Westinghouse**

TUNE IN WESTINGHOUSE-CBS TV-RADIO COVERAGE, PRESIDENTIAL CONVENTIONS, JULY 10-29

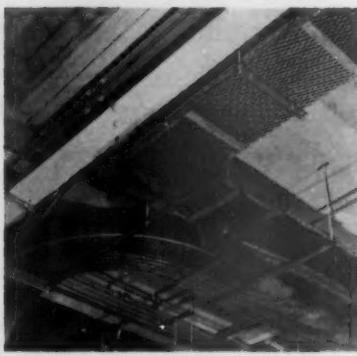
**Radiant Heaters Give More Uniform Curing of Blocks**



A refractories manufacturer got more uniform curing of organic binder in mold parts for blocks by the use of Pyrex brand industrial radiant heaters—a source of long wavelength infrared rays. After testing several other heating methods, the company installed a battery of 70 heaters, each 16 inches by 24 inches in size. Blocks get a more even cure without burning the tops and leaving the bottoms under-cured, thereby reducing production losses.

Write No. 686 on Inquiry Card—Page 34

**Expanded Cable Trough Reduces Magnetic Field**



A small manufacturing company replaced the cable supporting system in its plant with Cope expanded metal trough to get direct access to the entire length. The pattern design reduced the magnetic field to a negligible quantity and resulted in the elimination of intermittent surge loads and voltage drop. Welders can now be operated more efficiently on the lowest tap and the strength of the welds is at least as strong as before.

Write No. 687 on Inquiry Card—Page 34

**Electronic Weighing of Scrap Gives Uniformity**



An electronic system for weighing scrap—plus a melt-temperature measuring system—is producing these benefits for General Steel Castings, Granite City, Ill.: more melts per shift, greater uniformity from melt to melt, and automatic records of pouring temperature and types of scrap in each batch. The Leeds & Northrup Speedo-max G recorder, digital control point setters, weighing station, and series of signal lights enable the company to run four heats during the 9 p.m. to 7 a.m. shift.

Write No. 688 on Inquiry Card—Page 34

If it doesn't have it here—  
it doesn't have it!



and the  
**BROOK MOTOR**  
has it!

MANY MOTORS look practically alike on the outside, but it's what is inside that counts. There is no motor with better windings or more ample bearings—few motors compare favorably. Yet, the Brook Motor costs less, because of volume production, modern techniques, distribution in 76 countries and a realistic pricing policy. Brook Motors have established excellent performance records for over 56 years in every industry using a.c. motors.

From 1 to 600 H.P. Send for literature.

SINCE 1904



*world's most respected motor*  
**BROOK MOTOR CORPORATION**  
3302-04 W. Peterson Ave., Chicago 45, Illinois  
Factory Representatives, Warehouses, Dealers in Principal Cities.  
In Canada: Brook Electric Motors of Canada, Ltd.  
250 University Ave., Toronto, Canada

For More Information Write No. 494 on Inquiry Card—Page 34

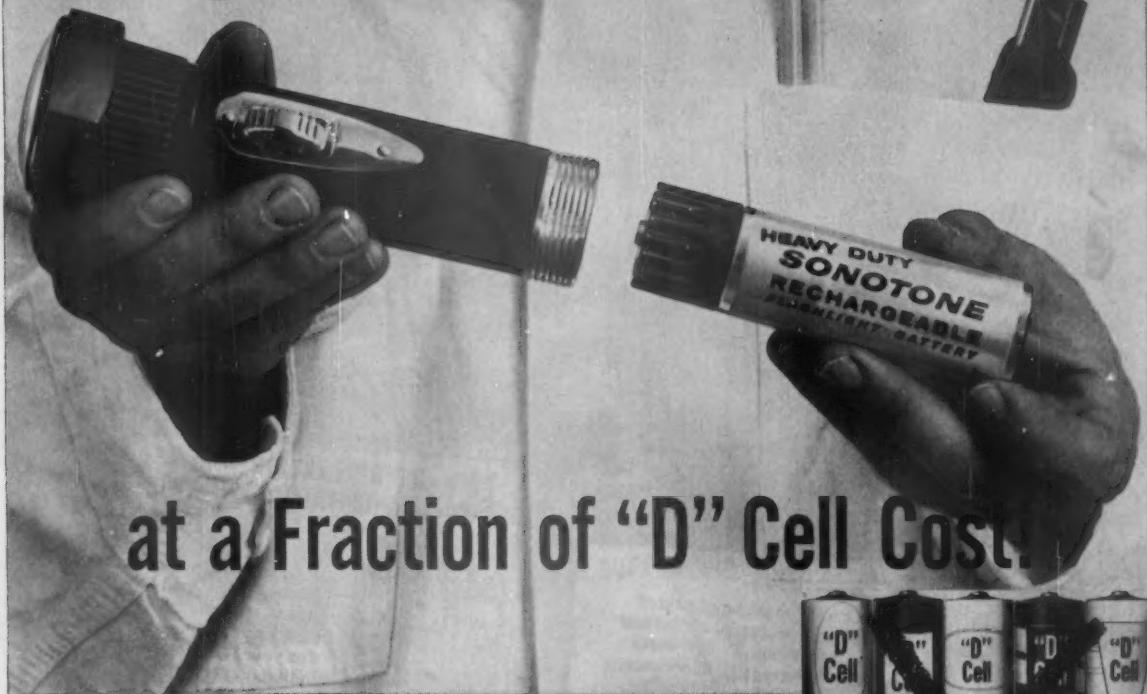
**Induction Heating Saves Railroad \$17,000 a Year**



A major railroad saves \$17,000 annually in heating rivets for box car maintenance jobs with Tocco Induction heating. Labor savings of 6240 man-hours per year are made, along with the use of \$1500 worth of fuel less than its former oil furnace. Proper tooling selects the right one of 10 sizes of rivets and delivers it through a chute to the riveter.

Write No. 689 on Inquiry Card—Page 34

# Stronger, Lifetime Flashlight Power



## at a Fraction of "D" Cell Cost.

### Heavy-Duty Sonotone Rechargeable Flashlight Battery Cartridge



To recharge, just unscrew cap ...



and plug overnight into any 110-120-volt AC outlet.

- A multi-use adaptation of the patented Sonotone sintered-plate, nickel-cadmium battery used in space missiles and jets.
- Gives at least 3 hours of strong, continuous light from a single charge with PR-6 bulb—or 1½ hours with full-powered PR-2 bulb.
- Dependable in extreme temperature and weather conditions.
- Can be recharged hundreds of times at about 4¢ per charge.
- Sturdy, leakproof construction—aluminum jacket—electrically shockproof.
- Full-year guarantee under heavy industrial use—backed by Sonotone's leadership of over 30 years in precision engineering and service.



A completely new concept in flashlight battery efficiency and economy for industrial users! Replaces and outmodes any two "D" cells, for any purpose, in end-to-end use. Rechargeable overnight by plugging into any 110-120-volt AC outlet. Gives maintenance and service personnel a battery with a lifetime of use at a fraction of the cost of constantly replaced "D" cells. Dozens of applications—with railroads, aviation lines, municipal departments, public utilities and private industries. **Heavy-Duty Model FC-3** (\$9.95 retail)—subject to your usual discounts. Also **Standard Model FC-2** for home use (light lasts at least 1½ hours with PR-6 bulb)—\$7.95 retail. Write now for full details to:

## Sonotone<sup>®</sup>

Battery Division, Dept. B47-50  
**ELMSFORD, N.Y.**

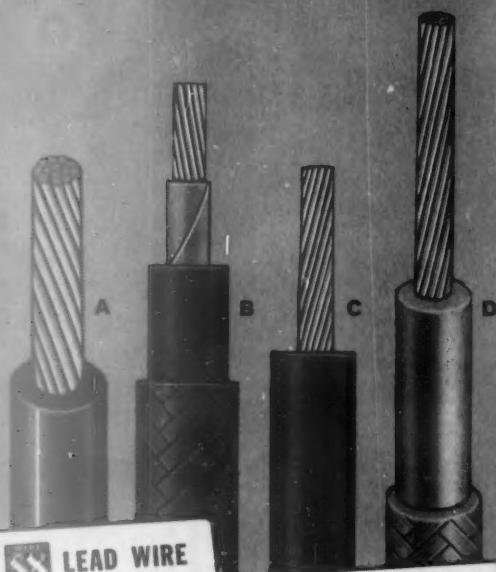
Leading makers of fine transistor hearing aids, ceramic phonograph cartridges, speakers, microphones, electronic tubes, sintered-plate, nickel-cadmium batteries.

For More Information Write No. 495 on Inquiry Card—Page 34

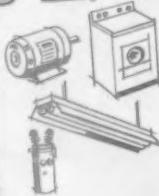
MAY 23, 1960

349

# To solve a special appliance wiring application economically



## LEAD WIRE



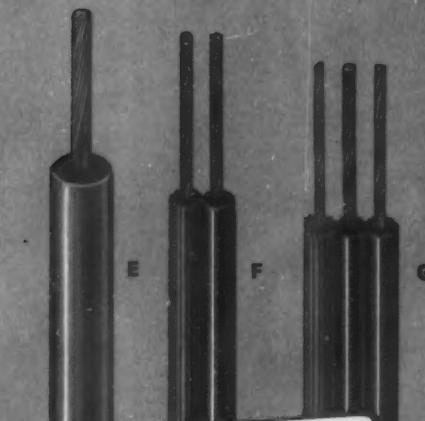
Essex Lead Wire is manufactured with plastic, rubber, neoprene and silicone insulations. Typical uses; motors, transformers, coils, fluorescent ballasts and fixtures, switchboards, panels, controls, rectifiers, or any general appliance wiring application.

**THERMOPLASTIC (A)** Polyvinyl plastics are well known for their dielectric strength and resistance to oils, solvents and chemicals. They are strong and durable. The plastics used for this group covers 80°C, 90°C and 105°C temperature ratings. U.L. approval on all items. C.S.A. on 90°C and 105°C except sizes No. 1 AWG and larger.

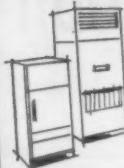
**RUBBER AND BRAID (B)** Essex P-300® has long been recognized as an outstanding and most acceptable motor lead wire. It is a 75°C Rubber Insulated, cotton braid, lacquered wire, both U.L. and C.S.A. approved, that is most commonly used with the usual baking cycles for motors, coils and transformers.

**NEOPRENE (C)** Essex N-900® a new wire in our line, has a high temperature oil resistant insulation. This is a 90°C lead wire with both U.L. and C.S.A. approval.

**SILICONE (D)** Today's need for high temperature material identifies Essex Sil-X® wire with a silicone rubber insulation, a glass braid, and lacquer finish, as an important item in our line. This product has U.L. approval for both 150°C and 200°C ratings depending upon the application and conductor stranding.



## SX. REFRIGERATION AND AIR CONDITIONING AWM



You can depend on performance if Essex Wire is engineered into your products. Choose from this complete line of wires and cord for your refrigeration and air conditioning equipment.

**THERMOPLASTIC (E)** This very simple but effective polyvinyl chloride construction, with insulation applied directly over the conductor is oil and flame resistant; has a high dielectric and mechanical strength, strips easily from the conductor, and colors are bright and permanent. It is produced with several temperature ratings and has both U.L. and C.S.A. approval.

**NEOPRENE (F)** The Neoprene insulation on this wire is applied over a tinned copper conductor to the thickness required and designated for specific applications. Many prefer this oil resistant wire, available with either a 75°C or 90°C temperature rating, because of its pliable insulation. U.L. and C.S.A. approval.

**RUBBER (G)** The 80°C and 75°C rubber insulation, applied over a tinned copper conductor, provides an excellent and economical appliance wiring material for internal wiring where no extra protection against oil and higher temperatures is necessary. U.L. and C.S.A. approved.



## OTHER ESSEX COMPONENTS THAT PUT LIFE IN YOUR PRODUCTS

### RBM Relays

Low cost, high quality relays, general purpose, open and hermetically sealed, motor starting, AC industrial contacts and starters; for Communications, Electronic and Appliance industries.

R-B-M Controls Div.,  
Essex Wire Corp.  
Logansport, Ind.



### Coiled Cords, Cord Sets

Plastic and rubber power supply cords. Terminations of all types (molded plastic and rubber). Complete line of Coiled Cords in H.P.N. Type SP and Types SV, SJ; covering full appliance range.

**CORDS, LTD.**  
Wire and Cable Div.  
Essex Wire Corp.  
DeKalb, Illinois



### Industrial Plastics

Flexible and rigid vinyl extruded shapes and foam custom designed and volume manufactured to meet your exact needs. Now producing for a variety of industrial applications.

**Carolina Industrial Plastics Div.**  
Essex Wire Corp.  
Mount Airy, North Carolina



and quickly... select from the

# ESSEX "STANDARDS"

in appliance wire and cable!



## SX FLEXIBLE CORDS



Essex offers you a complete line and the choice of rubber, neoprene, or plastic constructions, the cord best suited for your application.

**RUBBER (H)** Types S, SJ and SV portable and supply cords are made with high quality rubber insulation and jacket materials. Smooth flexible, tough and abrasive resistant, will provide years of trouble free operation.

**NEOPRENE (I)** Neoprene cords are identified by U.L. as types SO and SJO. Provides high resistance to oil, grease and alkalies. It is particularly suitable for industrial uses.

**THERMOPLASTIC (J)** ST, SJT and SVT thermoplastic insulated and thermoplastic jacketed cords are not affected by oils and greases and are highly resistant to alcohol, acids and most chemical solvents.

## SX POWER SUPPLY CORDS



Your requirements for refrigerator or air conditioning power supply cords can be adequately met with an Essex flat parallel cord that is designated by Underwriters' Laboratories as an SPT-3 Cord.

A parallel 60°C U.L. and C.S.A. approved polyvinyl insulated power supply cord that can be produced in numerous attractive colors to blend in with the appliance. The center or ground conductor in the 3 conductor construction is a separately insulated wire with 1/64" insulation thickness. U.L. approved.

## SX HEATER WIRE



Here is a wire designed for use in the refrigeration industry, for electric pads and many other purposes with an alloy that assures greater strength, and an insulation compound that resists the constant subjection to heat from the resistance core.

## THERMOPLASTIC, Thermoplastic-Nylon

This refrigerator heater wire has a fine No. 34 to No. 40 AWG alloy resistance wire wrapped spirally over a high tensile 20-pound Fortisan textile core. It is available with either of two thermoplastic insulations, with or without a .003" nylon jacket. U.L. approved.

Write now for illustrated brochure covering

the complete appliance wire and cable line.



# ESSEX Industrial Wire Products

WIRE AND CABLE DIVISION

ESSEX WIRE CORPORATION, MARION, INDIANA

MANUFACTURING PLANTS: Marion, Ind.; Jonesboro, Ind.; Sycamore, Ill.; Anaheim, Calif.

For More Information Write No. 496 on Inquiry Card—Page 34

MAY 23, 1960

351

**Circuit Breaker Assembly  
Uses 66% Less Space**



An explosion proof circuit breaker assembly made a 66% space saving at the plant of a leading manufacturer. The Nelson Manufacturing Company unit, on which as many as eight frame circuit breakers can be mounted, also saves 10%-15% on equipment cost and 30% on installation cost. Previously the company provided circuit protection and distribution with individual circuit breakers.

Write No. 690 on Inquiry Card—Page 34

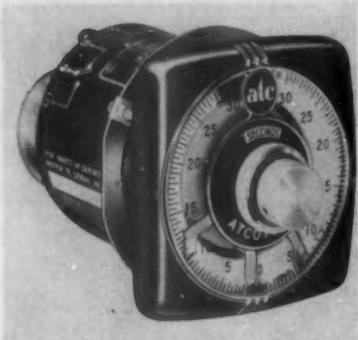
**Linen-Phenolic Wedges  
Remove Crushing Problem**



Bendix Aviation Corp., Teterboro, N.J. found in assembling miniature synchros and low-inertia motors that wedges used to position coils in their slots were crushing or swelling so they wouldn't fit. A changeover from hygroscopic insulating-type paper wedge to linen-phenolic wedges made by Taylor Fibre Co. eliminated both mechanical and assembly problems. Men and machines formerly needed for fabricating have been diverted to other work.

Write No. 691 on Inquiry Card—Page 34

**200 One-Relay Timers  
Save \$7600 Each Year**



A manufacturer of ore sampling equipment substituted timers with one relay for those with three relays on the control systems in his plant. Total annual savings were \$7600 on the 200 timing systems made by Automatic Timing & Controls, Inc. The substituted timer was able to do the same job as the previous one even though the auxiliary relays were eliminated.

Write No. 692 on Inquiry Card—Page 34



## SIL-RAP® Guideline Tape

An economical one-wrap primary insulation, mass produced at a competitive price. Tape bonds to itself without adhesive, forming

void-free insulation. Guideline for easy application. Excellent electrical and physical properties . . . ideal for insulating cables, wrapping coils, buss bars, electronic units . . . Wide range of sizes.



## SIL-BLU

A production tubing with outstanding physical strength, elongation and resistance to compression set. High resistance to ozone, water and weathering . . . superior dielectric properties. Post cured, meets AMS tolerances.

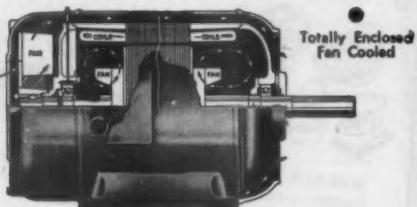


**WRITE** DEPARTMENT 301 • 3630 WOODDALE AVE.  
MINNEAPOLIS 16, MINNESOTA

For More Information Write No. 497 on Inquiry Card—Page 34



Type TEFC  
Polyphase



## Custom Built . . . But NOT Custom Priced!

Here is the most successful development in Air Cooled Motors. Reduces friction 75% — cuts power costs. Handles any power load emergency without damage to motor. Always cool running for continuous service in high temperatures. Squirrel cage induction, high torque, low starting current. Fully ball bearing and quiet running too.



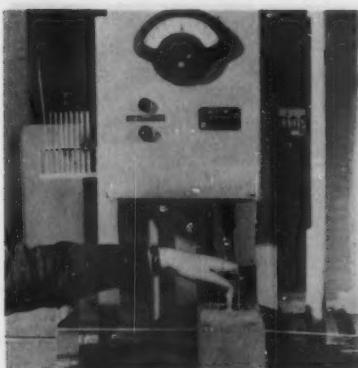
**Yes, Electric POWER  
at its Money-Saving  
BEST — by VALLEY**

WRITE FOR DESCRIPTIVE LITERATURE

**VALLEY**  
ELECTRIC CORPORATION  
4221 Forest Park Blvd., St. Louis 8, Mo.

For More Information Write No. 498 on Inquiry Card—Page 34

Wire Kept at Tolerance  
With Photoelectric Gauge



American Metal Moulding Co. saves dollars a day on its wire line with a photoelectric gauge operated for only a few cents a month. Diameter of the vinyl-coated building wire is kept exactly at Underwriters' tolerance by an automatic gauge control system built by Daystrom, Inc. No replacement parts are needed for at least 18 months. On the average run, the variance is never more than plus or minus a quarter of a mil.

Write No. 693 on Inquiry Card—Page 34

Scrap Prices Raised By  
Separating Two Types



Miehle-Goss-Dexter, Inc., Chicago, Ill. uses a system consisting of a hopper over an Eriez HI-VI vibratory feeder and a permanent non-electric magnetic agitator type drum to increase salvage of scrap metal. Because the system makes it possible to separate magnetic and non-magnetic types the company can get higher prices for its scrap.

Write No. 694 on Inquiry Card—Page 34

To help you get ...

THE ONE  
BEST BRUSH  
GRADE

**THAT** combines maximum economy with maximum life and freedom from operating difficulties on your specific motor under its specific operating conditions and requirements.

**STACKPOLE**  
*Custom Engineered*  
**BRUSHES**

\*Sold only to  
original equip-  
ment producers—  
NOT as brush re-  
placements.

Specifically "tailored" grades for all  
types of rotating electrical equipment.

**STACKPOLE CARBON COMPANY, St. Marys, Pa.**

Other Stackpole products: CONTACTS • VOLTAGE REGULATOR DISCS • BEARINGS • FIXED & VARIABLE RESISTORS • CATHODIC PROTECTION ANODES • MOLDS & DIES • FRICTION SEGMENTS • SEAL RINGS • CLUTCH RINGS • CHEMICAL ANODES • WELDING CARBONS . . . and many other carbon, graphite and powdered metal specialties

For More Information Write No. 499 on Inquiry Card—Page 34

**ACCO**  
for Better  
Values



Photo by Westinghouse Electric Corp.

## **STAND BY—Radioactive Material Below!**

The safe handling of this load of radioactive material rests in the hands of irreplaceable scientists and technicians. They've been given the safest and most modern handling equipment available to do their job—including ACCO Registered Wire Rope Slings.

Chances are the lifting of your product does not require the services of skilled "hot lab" technicians. Nevertheless, your rigger is also a skilled technician who shares heavy responsibility in the daily production of finished products or assemblies worth thousands of dollars. He is also entitled to the best tools available for doing his job, as is any other workman in your plant.

And the best slings you can give him are ACCO Registered Wire Rope Slings. Each is a precision-made tool that offers the modern patented wire rope ending—DUALOC. See box at right for other features these great slings give you.

**FREE 52-Page Catalog No. 9**—contains helpful information about strengths, weights, dimensions—also prices—of ACCO Registered Wire Rope Slings. Write our Wilkes-Barre office today.



**ACCO Registered**

## **WIRE ROPE SLINGS**

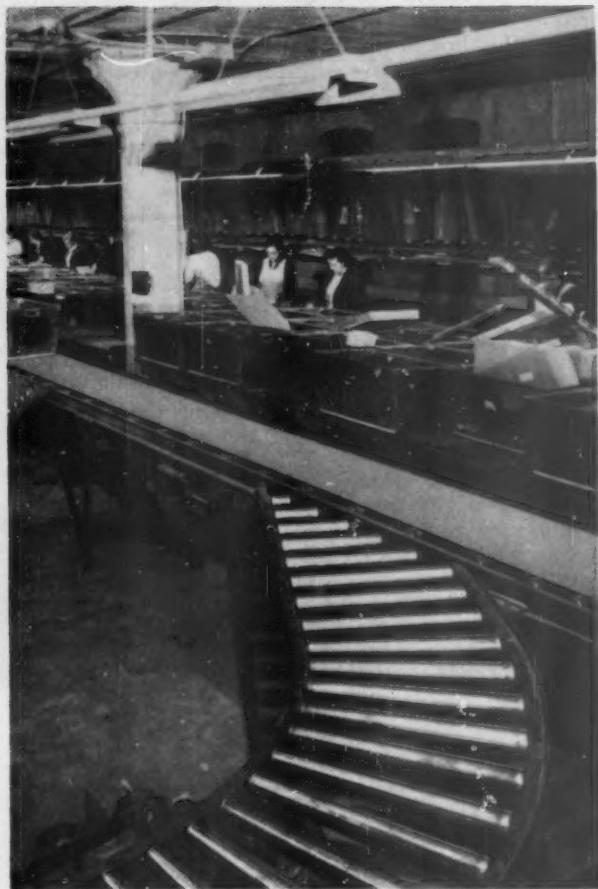
**WIRE ROPE SLING DEPT. • AMERICAN CHAIN & CABLE COMPANY, INC.**

Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh,

Portland, Ore., San Francisco, Bridgeport, Conn. • In Canada: Dominion Chain Company, Ltd., Niagara Falls, Ontario

### **"ACCO REGISTERED" MEANS**

- 1 The best material
- 2 Unit safety factor (on bodies, rings, links, hooks)
- 3 Proof test of complete sling to twice the working load limit
- 4 Actual field service test of each design
- 5 Metal identification tag on each sling
- 6 Signed Registry Certificate with each sling



V

## Materials Handling

A

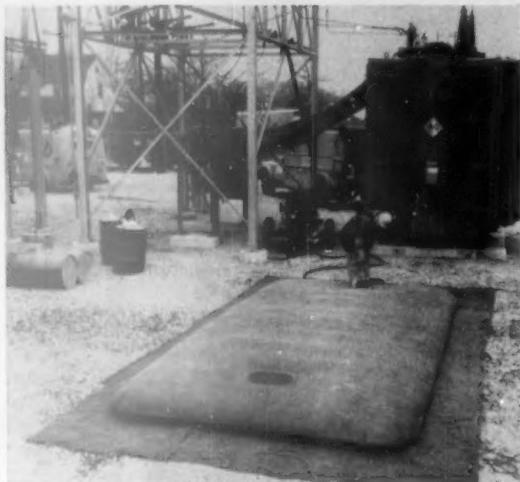
## Materials Handling



### Handle Large Crates Without Bolsters

An export packing firm in New York City, the Aacon Contracting Co., efficiently handles long, heavy crates with two Clark-Ross "pivot hook" carriers. Aacon uses the 20,000 lb. capacity carriers to move crates of heavy machinery from a dis-assembly line to the firm's storage yard. A carrier moves over a crate which has been lifted by an air-operated platform and picks it up with four forks, two on each side, which meet in the center to form two arms under the load.

WRITE NO. 501 ON INQUIRY CARD—PAGE 34



### Pillow Tanks Cut Time of Handling Transformer Oil by 63%

The Long Island Lighting Co. cut time and labor in removing oil from substation transformers from two hours to 45 minutes and also removed many accident risks. The maintenance division uses a Goodyear 3000 gallon, 320 lb. collapsible pillow tank to store the oil while repairing this equipment. Before using pillow tank, it was necessary to store the oil in steel drums, interrupting the drainage as each drum was filled.

WRITE NO. 502 ON INQUIRY CARD—PAGE 34



### Lightweight Containers are Durable, Easily Cleaned

K-V Pharmacal Co., St. Louis, custom-makes a wide variety of pills for drug houses. Though small, K-V is geared for high production requiring a steady flow of materials and products. They solved their handling problem with fiber-glass Stack-n-Nest pans made by the G. B. Lewis Co. The pans are lightweight and strong, yet can be stored in limited space. Other feature of the pans: inert to chemicals, and easily cleaned to avoid contamination of any new pill formula.

WRITE NO. 503 ON INQUIRY CARD—PAGE 34

For More Information about ad on facing page Write No. 504 on Inquiry Card—pg. 34→

PURCHASING



## LEASE...RENT...or BUY

### *Your Material Handling Equipment*

Towmotor Corporation and its subsidiary Gerlinger Carrier Company offer you three simple ways to improve your material handling operations . . . realize immediate savings . . . and accomplish this with little cash outlay.

1. You can put Towmotor-Gerlinger material handling equipment—fork lift trucks and material carriers—to work on a continuous round-the-clock basis through the Lease-A-Truck Plan. No down payment—no working capital tied up—just a small monthly charge.
2. You may also rent Towmotor-Gerlinger equipment on a short-term basis—as peak or seasonal demands require. You will start lowering handling costs immediately.
3. You can own new Towmotor-Gerlinger equipment by making reasonable monthly payments through

the Towmotor-Gerlinger Time Payment Plan. Low interest rates make it easy.

Complete factory supervised maintenance can be included in any of the above plans.

You'll find Towmotor-Gerlinger handling economies consistently pay the small monthly cost many times over. For complete information on any of these profitable, money saving plans, write or contact Towmotor-Gerlinger Rental Division, Towmotor Corporation, Cleveland, Ohio.

**TOWMOTOR** -GERLINGER  
THE ONE-MAN GANG

FORK LIFT TRUCKS, CARRIERS AND TRACTORS SINCE 1919  
Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

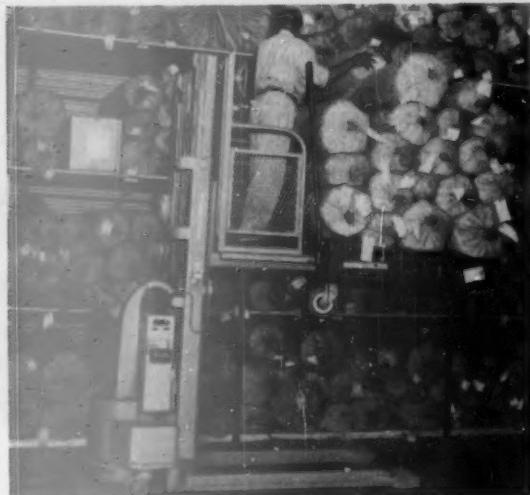
## Materials Handling



### Air-Powered Lift Truck Safe in Hazardous Environment

Handling open drums of paint was a problem for Columbus Coated Fabrics Corp. because electric or gas lift trucks were too hazardous. Drums were handled with a portable crane that was slow and limited to one level of storage. Then Columbus bought an air-powered lift truck, the American Air-Oil Safeway, that raises a full 55-gallon drum in 15 seconds. The unit holds drum even when air hose is disconnected. Push-pull connections are located every ten feet around the room.

WRITE NO. 506 ON INQUIRY CARD—PAGE 34



### Remote Control Trucks Cut Labor Costs in Half

At the United States Rubber Co., Winnsboro, S. C., Lewis-Shepard remote control, rider-type JackStacker trucks permit selective storage and order picking of a wide variety of yarns needed in the warp preparation for the weaving program. Trucks have cut labor costs in half. One man does the entire job of storing and filling orders, where two were previously needed.

WRITE NO. 506 ON INQUIRY CARD—PAGE 34



### Unique Swivel-Piler Increases Conveyor Storage Range 10 Times

A large steel mill found it could increase conveyor storage range nearly ten times by mounting a Stephens-Adamson centrifugal thrower unit beneath the discharge end of an unloading conveyor. The unit, called a Swivel-Piler, throws the ore, or other small lump bulk material, in any direction over an arc of 270°. This feature eliminates frequent shifts of the conveyor system.

WRITE NO. 507 ON INQUIRY CARD—PAGE 34

# Thor

Everything you want  
in Air Hoists . . .

*and more!*

Put a 30 lb. air hoist to work for you which lifts over sixty times its own weight. Easily handled by one man. Infinitely variable speed control from dead slow to 50 ft. per minute lift, 96 ft. per minute descent (1000 lb. model). Pendent or pull-cord control. Hook or trolley mounting. Roller or link chain. Automatic disc brake. 500, 1000, 2000 lb. capacities. Other models to 3 ton capacity. Your Thor factory representative or distributor will demonstrate in your own plant. Thor Power Tool Company, Aurora, Illinois. Branches in all principal cities.

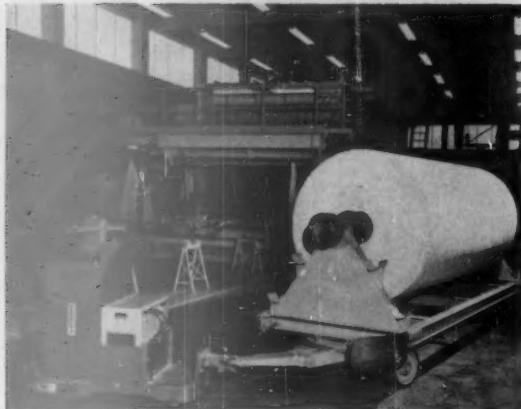


For More Information Write No. 508 on Inquiry Card—Page 34

MAY 23, 1960

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## Materials Handling



### 12,000 lb. Paper Rolls Moved Without Manpower

Blandin Paper Co., Grand Rapids, Minn., has installed a Barrett Guide-O-Matic driverless tractor system to haul 18-foot rolls of paper. The tractor automatically tows a trailer with the paper roll by following an energized wire embedded in the concrete floor. There is no connection between the floor and the tractor. Benefits include low cost of installation, safe operation and accuracy of positioning loads for machine feeding.

**WRITE NO. 509 ON INQUIRY CARD—PAGE 34**



### Palletless Handling Cuts Costs up to 50%

Cost reductions up to 50% have been reported by the Security Sales Co., Sandusky, Ohio, as a result of a switch to palletless handling. Pallet costs were eliminated, storage capacity increased from space formerly occupied by pallets, handling time reduced and pallet damage eliminated. The savings were made possible with four Hyster lift trucks—two with clamps, and two with standard arms.

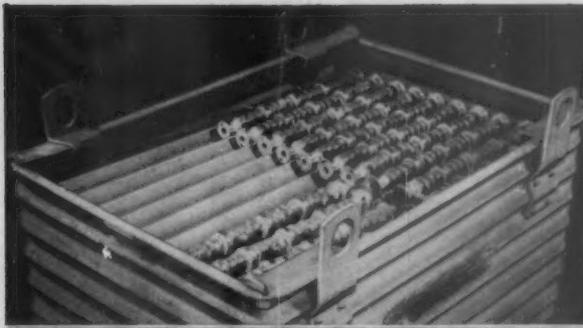
**WRITE NO. 510 ON INQUIRY CARD—PAGE 34**



### Magnets Keep Cans from Tipping in Heat Bath

Southeastern Packaging Co., St. Petersburg, Fla., specialists in filling aerosol cans, had difficulty in preventing some of the cans from falling off an underwater belt conveyor as they entered a heating bath. By installing Eriez non-electric magnetic Magna-Rails under the non-magnetic stainless steel belt even smaller cans, which formerly defied processing by this method, are now readily handled.

**WRITE NO. 511 ON INQUIRY CARD—PAGE 34**



**REUSABLE SPAULD-PAK** eliminates the disposal problem encountered with ordinary single use dunnage materials, such as cardboard or paper, and ends the cost of constantly replacing these materials. (The Spauld-Pak in this photo has been in use for over a year.) It cleans easily and stacks in compact piles when not in use.

**CORRUGATED SPAULD-PAK** cartonizes each part individually, yet offers the saving of group handling, as in the case of these Ford camshafts which are completely protected from damage through contact or deflection. Spauld-Pak forms a neat packing pattern automatically, cuts labor time during packing and unloading, reduces loss through damage and rejections.



## *This Is How SPAULDING Value Analysis Helped FORD MOTOR COMPANY* *Solve a Costly Materials-Handling Problem*

These photographs illustrate some of the ways in which Spaulding Spauld-Pak is being used to cut materials-handling costs at the Ford Motor Company, Dearborn Engine Plant and Standard Transmission Plant.

Lightweight Spauld-Pak, made of extra tough Spaulding Vulcanized Fibre, simplifies the handling, packing and storing of any material from camshafts to cookies.

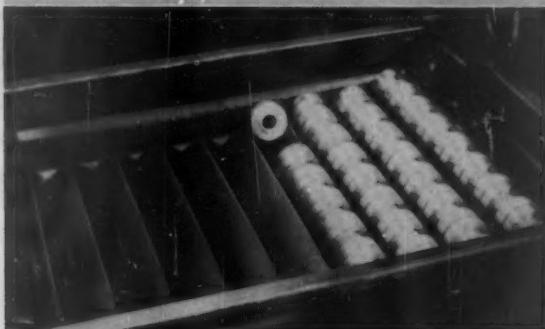
It's available in a variety of corrugated sheet sizes, or can be specially sized for special jobs.

*Write for our new Spauld-Pak brochure.*



Spauld-Pak accommodates all shapes and sizes at all stages of production. These gear blanks are protected from nicks that would mean extra machining. Spauld-Pak resists oils and the solvents used in de-greasing.

Spauld-Pak's flexibility of use in the manufacturing operation is demonstrated in the positioning of these finished gears. Small corrugations are used purposely to hold the gears in a handy upright position for faster removal from box to assembly points. Old-fashioned peg rack storing could damage the machining on the inner side of the piece.



**SPAULD-PAK**



*A Product of*

**SPAULDING FIBRE COMPANY, INC., 350 Wheeler St., Tonawanda, N. Y.**

For More Information Write No. 512 on Inquiry Card—Page 34

MAY 23, 1960

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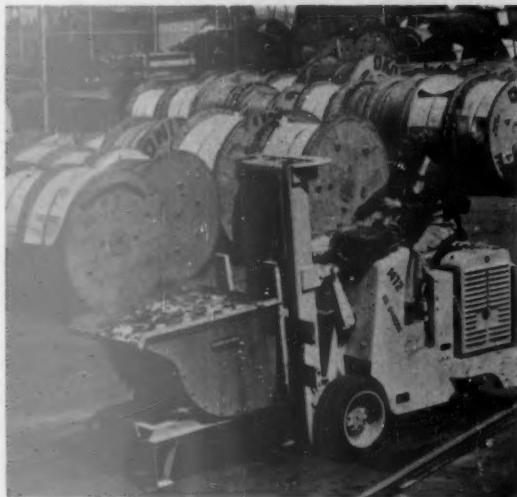
## Materials Handling



### Inter-plant Monorail Transport Prevents Breakage, Saves Labor

A major producer of chinaware insures safe transportation of the fragile product between plants with a roofed monorail system. When the new plant was first put into operation interplant transportation was by a powered truck pulling three four-wheeled carriers. This method was poor because of breakage due to pitted driveways, stalled trucks in the winter and exposure of the ware. Now there is no road maintenance or operator needed and weather is no problem.

WRITE NO. 513 ON INQUIRY CARD—PAGE 34



### Hoppers Speed Handling and Save Space at Cable Plant

By replacing tote boxes with self-dumping hoppers, the Okonite Co., Passaic, N.J., has speeded the handling of lead chips and gained valuable floor space. Six tons of lead chips, a by-product of cable manufacture, are moved daily between two widely separated production operations. To speed handling, Okonite installed half-yard capacity hoppers manufactured by Roura Iron Works. Hoppers hold more chips than tote boxes, can be handled by lift trucks, and can be stacked five high without spilling.

WRITE NO. 514 ON INQUIRY CARD—PAGE 34



### Woven Wire Gripper Sling Cuts Set-up Time in Half

One man using a gripper sling can now handle heavy, bulky electric motor parts that formerly required three men using other type slings—and the job gets done in half the time. The Herr Electric Co., Baltimore, uses woven wire slings that grip firmly and provide a broad surface to keep the load in balance. Even ticklish job of positioning large armature on lathe becomes a one-man operation.

WRITE NO. 515 ON INQUIRY CARD—PAGE 34



**SPOTTING** speed and accuracy are "right on the button" with this new Push Button Budgit Electric Hoist.

Push button action is so sensitive you can spot loads precisely in a few ticks of time. The control station fits the palm for one-hand operation, leaving the other hand free to guide the load.

The P:B Budgit has two automatic brakes. Heavy-capacity cranes have the same type of load brake. It's the only hoist with mechanical brake built into the motor. Each brake alone can hold the load.

Compartmented components add still more value to the P:B Budgit Electric Hoist. All electrics are enclosed, safe from dirt and moisture. So are the motor and motor brake. Gearing and load brake operate in an oil bath, sealed against airborne substances. Maintenance needs are simple as can be.

#### SEE BULLETIN FOR DETAILS

Compare the new P:B Budgit Hoist with any other electric in its class. It's a portable hoist you hang up, plug in, and use immediately with top efficiency, safety, convenience, and economy. Get full details, plus data on pull cord operated Budgit Hoists in AC, DC, and 12-volt battery powered models. Write for Bulletin 15010-15C today.



#### ASK FOR A FREE DEMONSTRATION

Operate the new P:B Budgit yourself! Be convinced that a new day is here in hoisting performance and low-cost load handling. Call your nearby Shaw-Box distributor.

**1/8 TO 2 TONS**

110	Volts AC.
220	Only 24 volts
440	at push buttons
550	on the higher voltage models for extra safety.

AUTHORIZED SERVICE STATIONS from coast to coast save time, trouble, and money for every Budgit user.



**BUDGIT ELECTRIC HOISTS**  
A Product of  
**MANNING, MAXWELL & MOORE, INC.**

Shaw-Box Crane & Hoist Division • Muskegon, Michigan  
In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

For More Information Write No. 516 on Inquiry Card—Page 34

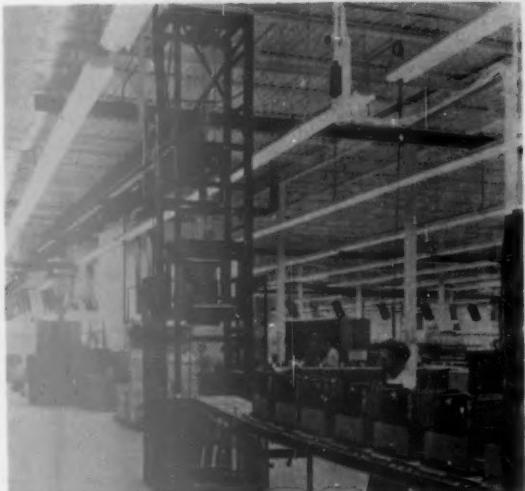
## Materials Handling



### Systematic Pattern Storage Saves \$2500 Annually

Pattern loss and handling damage totalling \$2500 per year was practically eliminated at the Andale Co., Lansdale, Pa., by using adjustable steel shelving and keying locations with a file card system. When production calls for a particular pattern, the pattern shop locates it immediately by its shelf number on the card index. Approximately 744 lineal feet of Penco Metal Products shelving provides 18,000 sq. ft. of storage space.

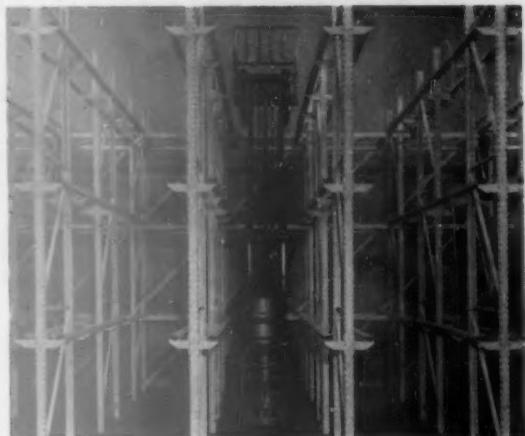
WRITE NO. 517 ON INQUIRY CARD—PAGE 34



### Planned Early, Conveyor System Cost Is Low in Smaller Plant

Complete conveyorizing doesn't have to be limited to large plants. Ebcu Manufacturing Co., employing 275 people, found that cost of putting in a complete conveyor system was not high when included in plant layout plans. They also found that resulting efficiency was high. Among the Standard Conveyor equipment installed is a limit-switch controlled automatic reciprocator, one of two used to form a 200 ft. detour of a dehumidifier assembly line.

WRITE NO. 518 ON INQUIRY CARD—PAGE 34



### Adjustable Racks Save \$20,000 Construction Costs

Fully adjustable, self-supporting drive-in racks allowing palletized storage four tiers high, will reduce storage area by 48% in new plant of Paraplegics Manufacturing Co., Franklin Park, Ill. The amount saved by construction of a smaller warehouse area is estimated at \$20,000. The Speedracks, manufactured by Storage Products Corp., cost less than one-tenth of the money saved.

WHITE NO. 519 ON INQUIRY CARD—PAGE 34

New steels are  
born at  
Armco



## Tuffy® Tips

—on safe use of  
Slings and Hoist Lines

Safety Council  
Cites Factors  
in Lifting  
Injuries



The National Safety Council reports nearly a fourth of all compensation cases are the result of unsafe handling methods or conditions. The following are listed as factors contributing to handling injuries:

"(a) Handling loads that are too heavy; (b) lifting or lowering with the back muscles instead of the leg muscles; (c) handling load with an insecure grip and failing to watch where hands are placed; (d) handling without sufficient help or failing to use mechanical equipment; (e) handling before getting a firm footing; (f) lifting or lowering with a jerking, twisting movement of the body, or when the body is in an awkward position."

### Maintenance Tips for Hoisting Equipment

- (1) Be sure crane and hoist controls are in proper working order. Don't use equipment that hasn't been tested recently.
- (2) Inspect hitching equipment before it is used. Re-check after use.
- (3) Remove hitching equipment not in use from hooks, hoists and loads. Don't allow it to remain loose.
- (4) Store slings systematically when they're not in use. Don't let them lie around helter-skelter. They may be damaged between lifts.

**FREE!**  
**New Tuffy**  
**Sling Handbook**



All about slings from A to Z, including types, dimensions and rated loads. Address Union Wire Rope Corporation, 2282 Manchester Ave., Kansas City 26, Missouri. Specialists in high carbon wire, wire rope, braided wire fabric, and stress relieved wire and strand.

3

**UNION**  *WireRope*



**Subsidiary of ARMCO STEEL CORPORATION**

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company  
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

For More Information Write No. 520 on Inquiry Card—Page 34

MAY 23, 1960

For More Information about ad on following page Write No. 521 on Inquiry Card - pg. 34→  
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# **Yale midget king**

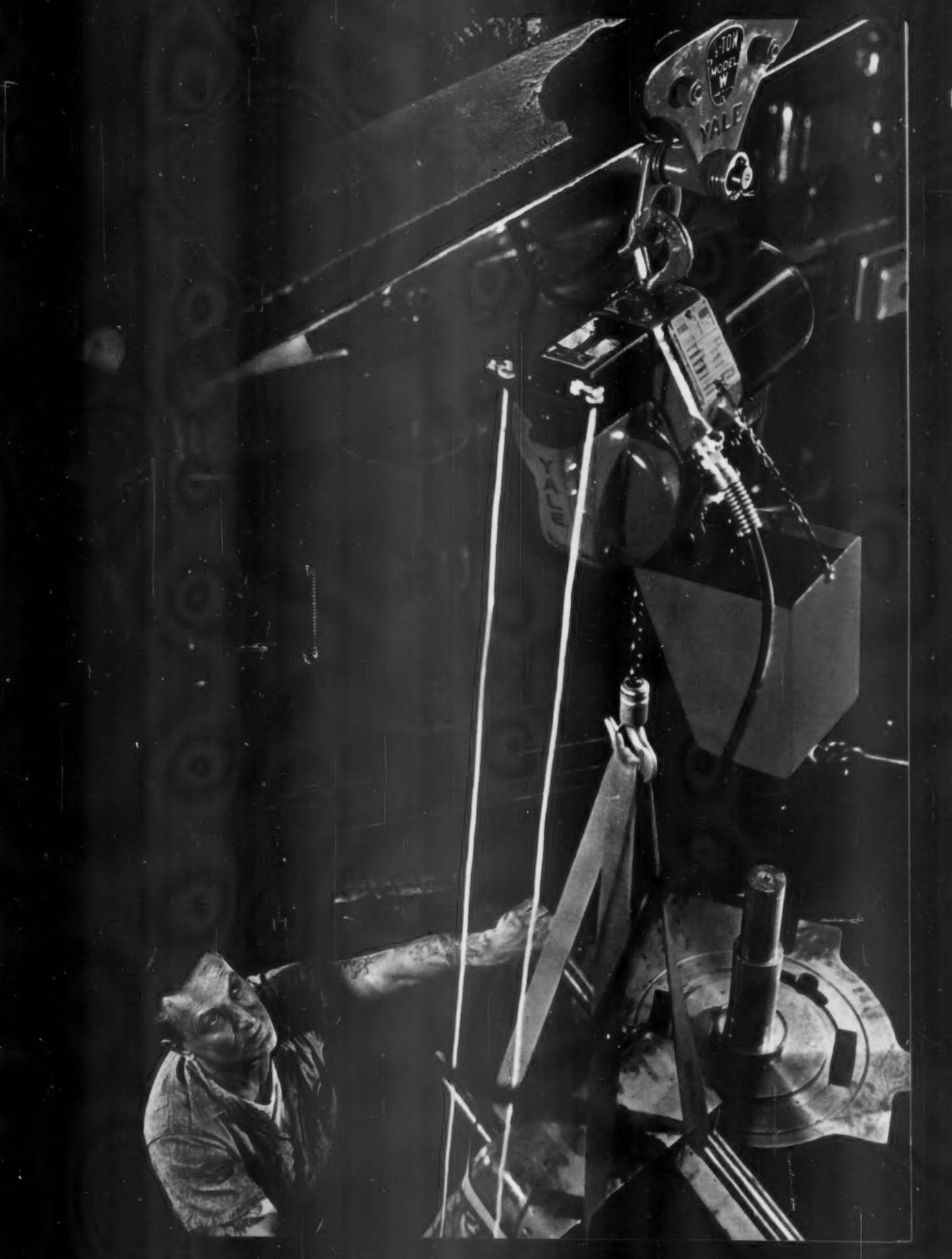
**link chain hoists are the newest development in the full line of Yale lightweight electrics. The versatile Midget King lets the operator pick up material not directly under the hoist itself because the durable alloy type link chain flexes in any plane. Easy to move and store, the Midget King can be operated for less than two cents a day. Hook or trolley models are available, in capacities of  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 and 2 tons.**

**Hoist-and-load protecting upper and lower limit stops plus two brakes provide positive safety. Hardened alloy steel gears assure lengthy, economical service. Roller chain models of the Midget King are also available. The complete line of Yale hand, air and electric hoists is ready for you — to accomplish any overhead handling task.**

**Contact your Yale distributor listed under "Hoists" in the Yellow Pages of your phone directory. Or write for brochure #577H to The Yale & Towne Manufacturing Co., Yale Materials Handling Div., Phila. 15, Pa., Dept. MH2.**

**Yale Materials Handling Division, a Division of The Yale & Towne Manufacturing Company. Manufacturing Plants: Philadelphia, Pa., San Leandro, Calif., Forrest City, Ark. Products: Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks Worksavers • Warehouses • Hand Trucks • Industrial Tractor Shovels Hand, Air and Electric Hoists.**

**YALE®**  
INDUSTRIAL LIFT TRUCKS  
TRACTOR SHOVELS • HOISTS  
**YALE & TOWNE**



*Truck values you can't see often count most!*



CHARLES BURGY  
San Francisco Service Engineer

## Ferry-Morse proved it in the case of the **CANTANKEROUS CONTAINER**

To cut handling costs, Ferry-Morse Seed Co. in Mt. View, California introduced a new bulk handling system for transporting and storing seed. Although the system proved sound, the method of handling posed a problem.

Ferry-Morse plant maintenance man, Charles Schembri called in Charles Burgy local ELPAR service engineer and together they developed a way to add a hydraulic rotating unit to their existing trucks. Now containers are rotated and dumped, eliminating the troublesome dumping method previously used. Result: the system has been operating dependably ever since...and, as always, there was no charge for the ELPAR assistance.

This case illustrates the point—*values you can't see often count most!* These ELPAR trucks not only proved versatile enough to meet a change in handling procedure...but Elwell-Parker is one company who is genuinely interested in helping customers find better handling methods...sometimes long after a truck has been sold.

If you want the most for your money—a top quality truck plus extra values like these—make your next truck an ELPAR!

*Write for a copy of ELPAR's general catalog.*

Leading producer of electric powered fork, platform and crane trucks

For More Information Write No. 522 on Inquiry Card—Page 34

### Lift Trucks Help Brick Manufacturer



An improved handling system utilizing lift trucks has increased efficiency at the Crawfordsville, Ind., Plant of Hydraulic Press Brick Co. A fleet of six Hyster lift trucks equipped with hydraulic brick forks handle brick in cube units of 328 each. One truck, setting at the rate of 60,000 bricks per day, completes loading a kiln in 2-1/3 days.

Write No. 701 on Inquiry Card—Page 34

### Chip Unloading 30% Faster With Front End Loaders



Use of front end wheel loaders has increased by 30% the rate at which saw mill chips are unloaded at International Paper Co., Spring Hill, La. An Allis-Chalmers loader maneuvers in close quarters and dumps load into hopper above conveyor belt that leads to processing room.

Write No. 702 on Inquiry Card—Page 34

### No Lift Truck Tire Trouble in Nine Years

When Publix Supermarkets built a warehouse to service 59 stores throughout Florida, company called in a B. F. Goodrich tire analyst to make recommendations. After studying floors,

loads, equipment, jobs, etc., he advised which tires would give longest service at lowest cost.



Nine years later company reports it never had a truck out of service because of tire trouble. Write No. 703 on Inquiry Card—Page 34

### Leveler Adapts Trucks to Dock



Consolidated Paper Co., Monroe, Mich., large producer of containers, had a problem handling trucks with different bed heights. It was solved by installing ten Rotary truck levelers, hydraulically operated devices which are recessed into the loading dock pavement and raise or lower the truck bed to bring it level with the dock surface.

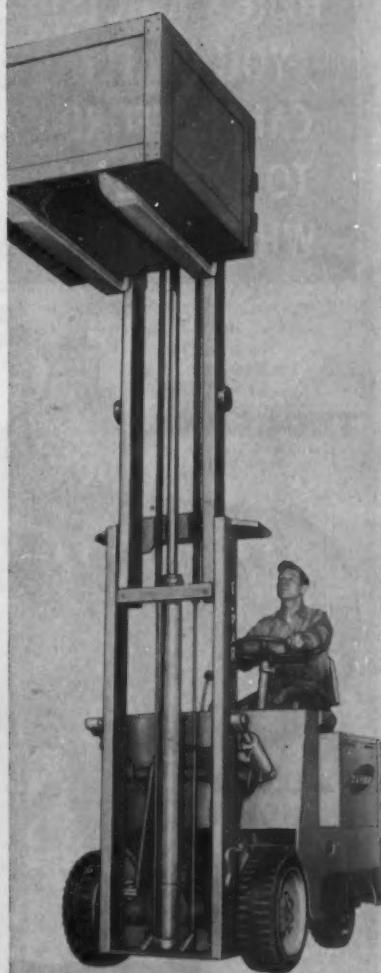
Write No. 704 on Inquiry Card—Page 34

### Lift Truck Steps up Handling 50%

One 10,000 lb. capacity lift truck serves eight fabricating departments at Whitehead and Kales Co., Inc., Detroit. The

(Please turn to page 370)

## ACRO-SMOOTH



### Slashes Truck Maintenance 55%

- A new concept in truck design . . . with step-less speed control
- demountable electrical and hydraulic controls . . . easier service accessibility . . . plus, a host of other important features that can halve your maintenance. Eliminate accidents . . . increase work output with ELPAR's new "Acro-Smooth", 4,000, 5,000, 6,000 and 7,000 lbs. capacity.

Write for Complete Details Today!

**ELPAR**  
THE  
**ELWELL-PARKER**  
ELECTRIC COMPANY

4035 ST. CLAIR AVE. • CLEVELAND 3, OHIO  
For More Information Write No. 523  
on Inquiry Card—Page 34

PURCHASING AGENTS  
HERE'S A HOIST  
YOU REALLY  
CAN'T AFFORD  
TO OVERLOOK  
WHEN BUYING

**Lodestar®**

the newest of hoists... the first truly heavy-duty version of the small electric hoist.

... a hoist with features and performance never before available in a small electric hoist.

... a hoist that is priced surprisingly low because of its more efficient design and automated production.

THOUSANDS

ALREADY IN USE



ELECTRIC  
HOIST

Complete range of capacities from  $\frac{1}{2}$  to 2 tons and lifting speeds from 8 to 60 fpm. Single and 3 phase.  $\frac{1}{2}$  ton size weighs only 51 lbs.

#### TYPICAL FEATURES

- Safe, Heavy Duty Performance
- Push Button Control
- Lifetime Lubrication
- Self-Adjusting Magnetic Brake
- Ultra-Modern Electric Braking
- Minimum-Maintenance Operation
- Fully Enclosed Protected Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

#### CHISHOLM-MOORE HOIST DIVISION

Columbus McKinnon Chain Corporation

Tonawanda, New York

REGIONAL OFFICES: NEW YORK • CHICAGO • CLEVELAND

In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

For More Information Write No. 524 on Inquiry Card—Page 34

(Continued from page 369)

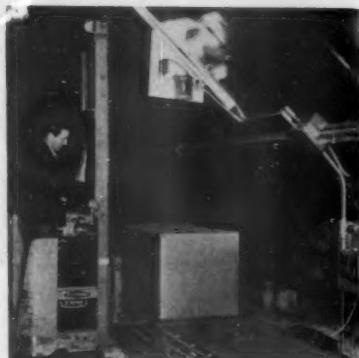
truck, a Gerlinger Model S-10, is dispatched from a central point about 40 times a day for individual jobs, travels about 20



miles during a normal eight-hour working day. Corrugated steel pallets are used in handling 8000 lb. loads of structural detail. Truck uses 9-ft. fork extensions in moving steel axle and engine racks.

Write No. 705 on Inquiry Card—Page 34

#### Handling System Saves \$25,000 Annually



The Palatine Dyeing Corp., St. Johnsville, N. Y., provides a dual service of storing customers' goods until sold and then processing them. Antiquated warehouses, some scattered as far as 12 miles from the plant, prevented use of mechanical handling equipment. A new Quonset type warehouse was built adjoining the main plant with space to hold the goods consigned. An electronically controlled conveyor, cantilever racks and two Raymond narrow aisle trucks save \$25,000 annually on labor.

Write No. 706 on Inquiry Card—Page 34



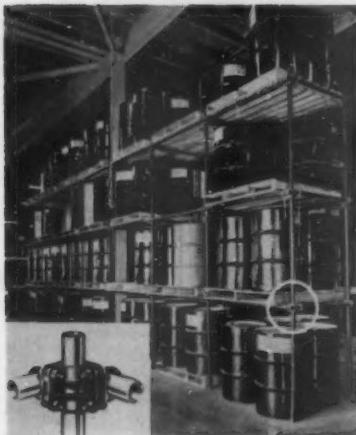
**Pallet Truck Cuts  
Waste Aisle Space 50%**



Kaiser Aluminum & Chemical Sales, Inc., Chicago, has coordinated hand pallet and fork lift truck operation to cut waste aisle space in half. In the warehouse section for wire, all load placement is done with an American 27 in. wide 4000 lb. capacity pallet lift truck with 48 in. forks. The truck maneuvers the stacked wire in 5-foot aisles, compared to the 10 ft. aisles for ordinary fork lift trucks.

Write No. 707 on Inquiry Card—Page 34

**Saves 25% of Space  
With Pipe Racks**



A space saving of 25% was effected in the California plant of Turco Products, Inc., a major manufacturer of industrial chemical compounds. Through the use of ordinary 1½ in. pipe and Tube-Strut universal clamps a total of 200 lineal feet of racks was economically constructed by the company's own personnel.

Write No. 708 on Inquiry Card—Page 34

# Nutting

shows you  
**"HOW"...**

**the widest choice of floor trucks  
in the world can cut your costs!**

For regular or "special" design floor trucks it pays to talk to Nutting first. Here's why: no other company makes more models, sizes or combinations of equipment than Nutting. Many times items which you may find listed as "specials" with other makes are regular equipment in Nutting's complete line. As a result you get "custom built" trucks at production line prices. You not only get overall lower prices; you also get the benefit of 68 years of experience, design "know-how" and modern manufacturing skills. To save valuable hours of your time and get the right equipment for your plant, talk to a Nutting representative first, for all your floor truck needs!

**Nutting makes over 1000 products, here are just 16 of them**



Dollar for dollar, feature for feature Nutting is your best floor truck buy. Write for your free copy of new Junior Catalog 59G.

**Nutting**  
TRUCK AND  
CASTER COMPANY  
Faribault, Minnesota



NUTTING TRUCK & CASTER COMPANY  
252 Division Street • Faribault, Minnesota  
Please send copy of Junior Catalog 59G.

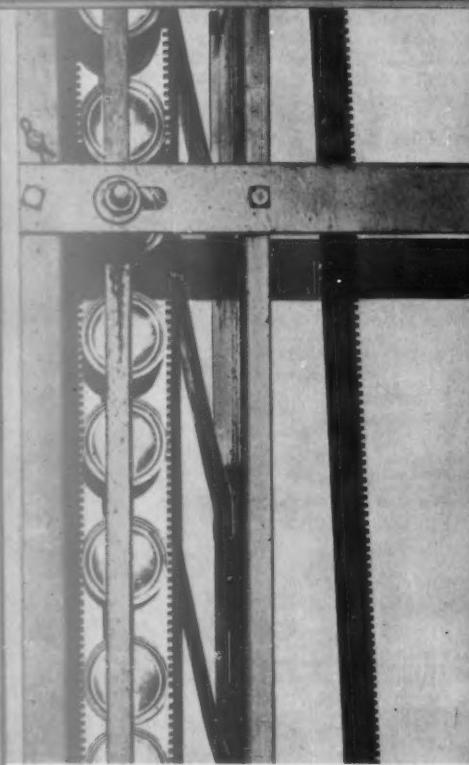
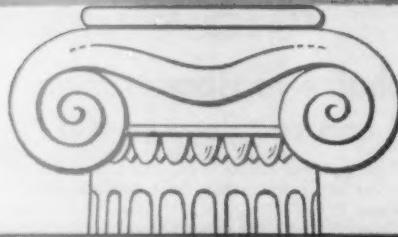
NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

For More Information Write No. 525 on Inquiry Card—Page 34

For More Information about ad on following page Write No. 526 on Inquiry Card—pg. 34→

MAY 23, 1960

# HAULS OF



**Hoisting Millions of Beers  
—straight up—with never a slip**

At the giant Anheuser-Busch brewery, this pair of U.S. SteepGrade Conveyor Belts lifts 16-oz. cans of beer at a 90-degree angle.

"No other belt could have accomplished better performance. It's nothing short of spectacular," says the manager of the brewery.

As the 1-lb. cans come from the pasteurizer slippery and wet, they roll onto the vertical can conveyor where SteepGrade carries them straight up and onto an incline to the carton-filling machine. Cans don't slip at all, even when the conveyor is stopped.

The secret is SteepGrade's exclusive "gripper cleat" construction—a molded, integral part of the belt itself. These thousands of "gripper cleats" hold the cans firmly, yet gently. This means far less pressure, far less belt speed is required. Damage to cans and print smearing is eliminated. And the more efficient operation saves electric power, lengthens belt life.

**H**ERE are on-the-job stories of three United States Rubber Conveyor Belts, taken from "U.S." belt records in package handling.

These belts are just some of the "U.S." standouts which demonstrate, year after year, why "U.S." is the world's largest producer of conveyor belts.

For steady, day-in-and-day-out dependability in conveyor belting, it always pays you to secure the advantages of "U.S." Engineering. "U.S." Engineers work directly with "U.S." Distributors or original equipment manufacturers to assure their obtaining the right belt recommendations for each type of conveying.

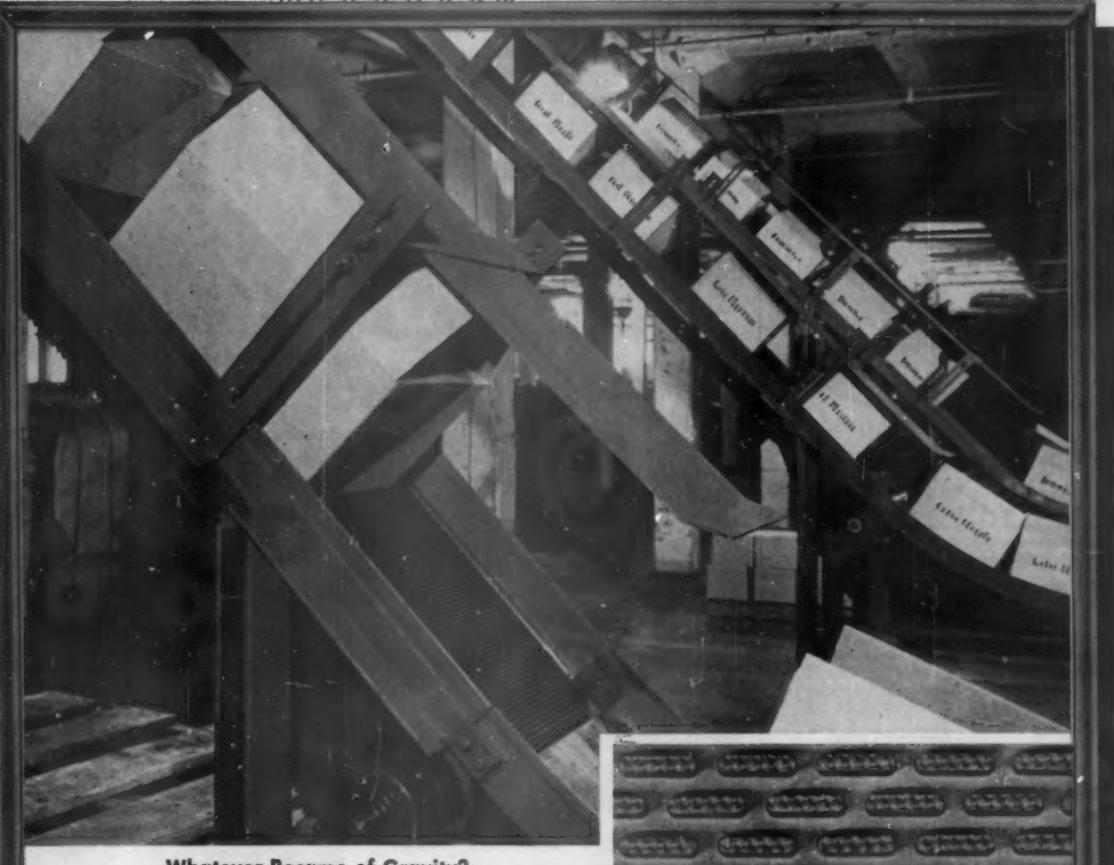
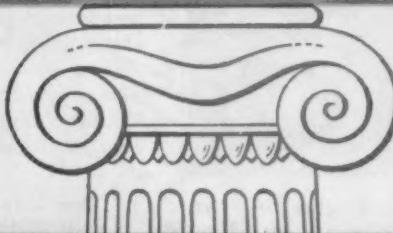
The most comprehensive belting engineering information in the industry is available through your "U.S." Distributor. It will pay you to check with him.

**U.S. STEEPGRADE,  
serving the world's great airlines**

Next time you're at an airport chances are you'll be able to see U.S. SteepGrade Conveyor Belting in action. You'll see it carrying cargoes on steep inclines and declines—as steep as 45 degrees. It speeds up loading, reduces manual labor for today's leading airlines.

Again notice the gripper cleats in SteepGrade. They cannot be torn off by heavy boxes. SteepGrade is weather resistant, will not stiffen in extremely low temperatures and is self-cleaning.

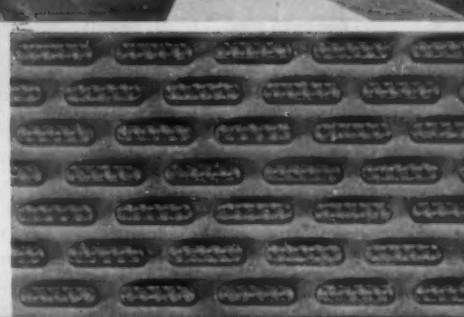
# FAME



## Whatever Became of Gravity?

It's hard to believe that these cartons are not nailed down, so steep is the angle of descent.

Before the installation of U.S. SteepGrade Belts (10 in all) in American Can Company's Baltimore, Md. plant, cartons went down chutes. This often caused pile-ups at the bottom, with spilled cans, broken cartons and lost tempers. But SteepGrade now offers controlled descent, with cartons evenly spaced.



Mechanical Goods Division

**United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

Visit us at N.A.P.A. Convention, Los Angeles,  
Calif., May 22-25.

In Canada: Dominion Rubber Company, Ltd.

**DATA**  
you need

AT YOUR  
FINGERTIPS

*Ask  
for*



No. 60  
MANUAL

Here's a surer, easier way to specify

## DARNELL CASTERS & WHEELS



### 1 RUBBER TREADS

a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

### 2 RUST-PROOFED

by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

### 3 STRING GUARDS

Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

### 4 LUBRICATION

all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gum lubrication.



Look in the Yellow Pages for your Darnell Distributor under "Casters".

**DARNELL CORPORATION, LTD.**

DOWNEY (Los Angeles County) CALIF.  
37-28 SIXTY-FIRST, WOODSIDE 77, L.I., N.Y.  
36 NORTH CLINTON ST., CHICAGO 6, ILL.  
1000 PEACHTREE N. E., ATLANTA, GA.

For More Information Write No. 527  
on Inquiry Card—Page 34

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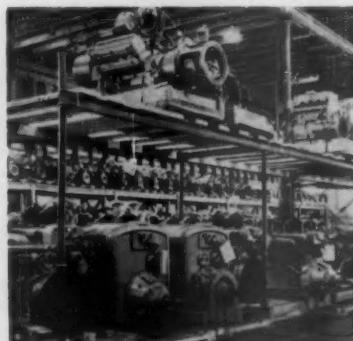
### Ferris Wheel Speeds Pipe Handling



Twenty-foot lengths of cast iron pressure pipe are sorted according to diameter by a revolving ferris wheel at the Council Bluffs, Iowa, pipe plant of the Griffin Wheel Co. The wheel has openings of various sizes on its rim. As it turns, pipe with diameters from 4 to 12 inches move into the proper slot and subsequently sort themselves onto chain conveyors. Wheel saves time and eliminates damage from handling by crane.

Write No. 709 on Inquiry Card—Page 34

### Save 50% Space for Heavy Storage



A new type universal clamp helped storing heavy compressor engines for Stewart & Stevenson Services, Inc., Houston, Texas. Storage racks were made of ordinary pipe and I-beams fitted together with Beam-Strut universal clamps. Material handling time was reduced 20% and a 50% saving resulted in floor space. The racks are 100% adjustable and re-usable, and no drilling, welding or threading is required.

Write No. 710 on Inquiry Card—Page 34

### New Pumps Last Five Times Longer

An appliance manufacturer handling metallic paint containing abrasive material experienced a pump life of only two months until switching to special abrasive resistant pumps. The new pumps now have been operating for ten months and are still in good working order. The pumps are manufactured by the Viking Pump Co.

Write No. 711 on Inquiry Card—Page 34

### One Man Does Work of Four With Power Loader



At the Simpson Paper Co., Lowell, Wash., one man with a Hough Payloader is doing in minutes what a four-man crew needed hours to accomplish manually. The loader can cope easily with loose papers and magazines, and storage room capacity is doubled by machine's ability to pile high and push material into empty areas.

Write No. 712 on Inquiry Card—Page 34

### Increase Warehouse Air Space Usage



A 600% increase in efficiency has been achieved at the Muskegon, Mich., warehouse of Norge Div., Borg-Warner Corp. Two

(Please turn to page 376)

PURCHASING

## PICK the RIGHT HANDLING TRUCK

**EQUIPMENT  
SELECTOR**

ONE SOURCE FOR THIS  
**COMPLETE**  
LINE OF MATERIALS  
HANDLING EQUIPMENT

**LEWIS-SHEPARD**  
The MARKET Line — The COMPLETE Line of Materials Handling Equipment  
675 WALNUT STREET — WATERTOWN 72, MASS.

This handy reference describes Lewis-Shepard's complete line of "manually-operated," "intermediate" and "all-electric" equipment. Here is everything you need for a fully-integrated materials handling system. Write today for your free copy of L-S Condensed Catalog 80-204.



675 Walnut Street, Watertown 72, Mass.

For More Information Write No. 528 on Inquiry Card—Page 34

## How to Get Your Name on the Mailing List

and receive your own personal copies  
of PURCHASING as soon as issued!

Why wait to see pass-along copies when it is so easy to have your own subscription? You can read PURCHASING at your own leisure . . . and build a valuable idea file of helpful articles, or save the entire magazine.

The know-how you accumulate this way will be returned many times over by making your work easier . . . and more profitable.

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205 E. 42nd St., New York 17, N.Y.

Send me PURCHASING every-other-week, as fast as issued, at your bargain rate of only \$4 for the 26 copies.

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Name .....

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Address .....

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Zone .....

Send Purchasing to my home address:-

## COLUMBIAN Offers you "Checkpoints" TO AID IN BUYING ROPE

Price is important.

Total cost is more so. And since this sum is complicated by many hidden qualities affecting usable life and dependability, COLUMBIAN offers a short list of check points for use in measuring one rope against another.

For any given size, check breaking strengths — feet per pound — water, rot and fungi proofing.

(COLUMBIAN ropes are fibre-deep treated by world-famed COLUMBIAN lubricants against water, rot and fungi.)

In considering synthetics, shrinkage is an important check point — the less the better.

(COLUMBIAN synthetic ropes are guarded by an exclusive "stabilizing" process that reduces shrinkage to zero.)

Using these check points to describe the three COLUMBIAN ropes pictured here, you would find that: the  $\frac{5}{16}$ " COLUMBIAN TAPE-MARKED MANILA has a 1,000 pound breaking strength; runs 34' 6" per pound; weighs 35 pounds per 1200 foot coil; is water, rot and fungi proofed.

The  $\frac{3}{8}$ " COLUMBIAN FILAMENT NYLON has a 2700 pound breaking strength; runs 27' 7" per pound; weighs 43 pounds per 1200 foot coil; is stabilized against shrinkage.

The  $\frac{5}{16}$ " COLUMBIAN FILAMENT DACRON has a 1080 pound breaking strength; runs about 56 feet per pound; weighs 21 pounds per 1200 foot coil; is stabilized against shrinkage.

So . . . before buying any other brand of rope, compare it to COLUMBIAN. Use these check points. COLUMBIAN is confident that you will find the hidden qualities that have made COLUMBIAN famous and trusted. Qualities that mean a longer usable life and a greater dependability. Qualities that mean less "total cost" to you.



Ideally Packaged for Stockroom Use



**COLUMBIAN ROPE  
COMPANY**

Auburn, "The Cordage City," N.Y.

For More Information Write No. 529 on Inquiry Card—Page 34

**Stack  
'em...**

**Move  
'em...**

**Stock  
'em...**

**in  
Quantity**

**on  
Faultless  
Casters**

Eliminate costly, one-at-a-time handling methods with Faultless Casters! Parts—even heavy ones—can be stacked high on Faultless Casters, ready for further processing. Fully loaded Faultless Castered trucks, carts, dollies, racks roll easily, smoothly . . . carrying your products from machine to machine, around corners, down narrow aisles, even outdoors. And products stocked on Faultless Castered equipment require minimum rehandling for packaging, or shipping. Faultless engineers a complete line of precision casters to meet your specific requirements.

**ASK YOUR DISTRIBUTOR.** Your nearby Faultless Industrial Distributor and the local Faultless Sales Engineer will work with you to eliminate costly one-at-a-time handling methods at your plant.



Casters illustrated are typical of complete range of load capacities and types available for every materials handling job.

**Faultless Caster Corporation**

Casters

Evansville 7, Indiana

Branch Offices in principal cities; see the Yellow Pages of the telephone book under "Casters." Canada: Stratford, Ontario

For More Information Write No. 530 on Inquiry Card—Page 34

376



(Continued from page 374)

men with Yale 4000 lb. capacity trucks now handle as many refrigerators as 12 men with portable stackers formerly could. The trucks are LP-gas powered and feature a telescopic mast which lifts to 274 inches, permitting stacking five high, increasing usable warehouse space by 25%. Write No. 713 on Inquiry Card—Page 34

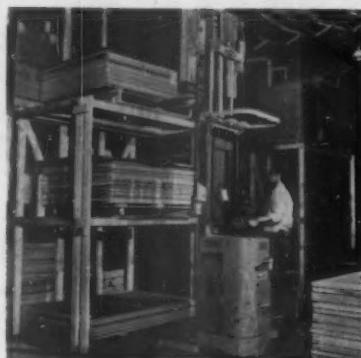
**Saves \$3000 per Year  
With Magnetic Pulley**



The Falls Foundry, Menomonee Falls, Wis., saves \$150 per month by eliminating pattern damage caused by tramp iron and by preventing injury to workers' hands. Formerly paying to have scrap iron removed from foundry sand, the foundry now uses a Stearns ceramic permanent magnetic pulley to do the job. The first time pulley was used it pulled out over six tons of iron. Total savings add up to \$3000 annually.

Write No. 714 on Inquiry Card—Page 34

**Narrow Aisle Lift  
Trucks Save \$16,000**



Western Moulding Co., Inc., Milwaukee, saved \$16,000 by purchasing narrow aisle lift trucks. Narrow aisles added 5000 sq. ft.

PURCHASING

to the usable floor space. With pallet method of unloading and handling, two fewer men are moving and storing 30% more material, a saving of \$200 each week. Trucks are manufactured by the Raymond Corp.

Write No. 715 on Inquiry Card—Page 34

**Reduce Loading Time  
up to 66%**



Bird & Son, Inc., East Walpole, Mass., building materials manufacturer, uses Towmotor lift trucks equipped with hydraulically operated attachments and special pallet holding devices to speed shipping. Eliminating cost-

ly hand-loading operations has reduced the number of man-hours required for truck loading operations as much as 66%.

Write No. 716 on Inquiry Card—Page 34

**Roll-In Battery Cart  
Speeds Handling**



At International Business Machine's San Jose, Calif., plant, this cart with twin roller conveyor sections speeds and simplifies installation and removal of Exide batteries from electric industrial trucks. The cart also serves as a workstand for main-

tenance and repair work on the batteries. The cart is made by Rapistan of California.

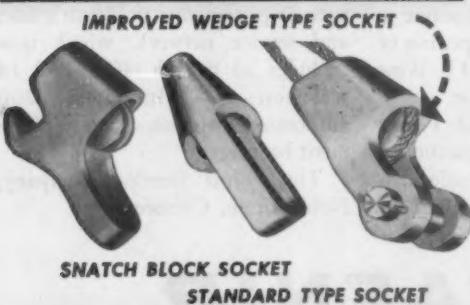
Write No. 717 on Inquiry Card—Page 34

**Unit Loading Cuts  
Handling Cost Up to 90%**



By purchasing solid fatty acids in unitized carloads and truckloads, customers of Emery Industries, Inc. report savings from 78 to 90% in man-hours required for unloading and storage over conventional loading of loose bags. Units consist of 2000-pound loads in 50 lb. bags on disposable pallets.

Write No. 718 on Inquiry Card—Page 34



SNATCH BLOCK SOCKET  
STANDARD TYPE SOCKET

**FARRELL-CHEEK STEEL CO.**

105 LANE STREET, SANDUSKY, OHIO

For More Information Write No. 531 on Inquiry Card—Page 34

MAY 23, 1960

## **FARRELL-CHEEK SHEAVES and Wire Rope Fittings**

*Cast Steel and 50 years of know-how in using it account for the superiority of Farrell-Cheek sheaves and wire rope fittings. Actual service in the field readily confirms all claims.*



**Cable Saver  
Grooves →**

Sheaves with Cable Saver Grooves and unmatched resistance to fatigue and wear. ★ Choker Hooks of great strength and utility ★ Standard, Wedge Type and Snatch Block Sockets of many performance features ★ Clips, Thimbles and Eye Hooks . . . all electric furnace cast from Farrell-Cheek carbon and F85 alloy steels.

You'll find the entire line in CATALOG 22, complete with specifications. WRITE TODAY.



*Finest Name in Cast Steel!*

# Bearing Buying Guide

NO. 7



A REPORT ON FAFNIR BEARING DEVELOPMENTS AND DISTRIBUTION ACTIVITIES

## FAFNIR PIONEERS USE OF COMPUTERS FOR BEARING RESEARCH

An entire new concept in bearing engineering has been developed by Fafnir with the use of digital computers for analysis of bearing and machinery designs, metallurgy, processing, and quality control.

The speed and accuracy of digital computers in bearing research is strikingly borne out in determination of bearing loads. An early test showed that an entire month's work using a desk calculator could be produced with absolute accuracy in a three-minute computation.

Today, Fafnir engineers are using electronic computers for such calculations as those involved in determining complicated bearing loads in wobble plate mechanisms, helicopter, machine tool, and critical aircraft applications.

With digital computers, solutions to vital and complex bearing problems can be reached immediately and with unerring accuracy.



Fafnir engineer checks calculations in solving bearing problem with aid of digital computer.

## BEARING LUBRICANTS RUN A GAUNTLET OF TESTS AT FAFNIR

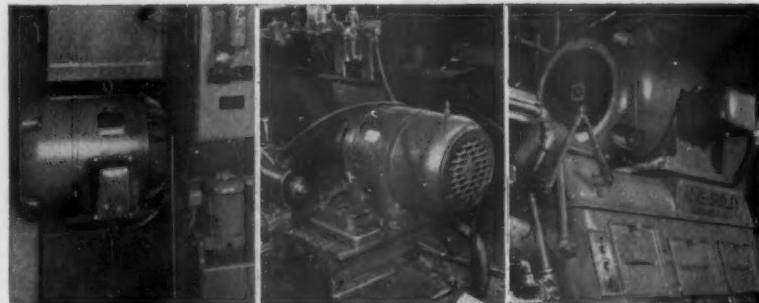
Cleanliness, oxidation resistance, noncorrosiveness, stability, water-resistance, viscosity . . . these and other characteristics of lubricants have a direct and vital effect on ball bearing performance.

At Fafnir, elaborate laboratory analysis of bearing lubricants is carried on continuously to check the quality of each batch of lubricant received, to analyze new lubricants, and to meet special requirements of customers.

Fafnir's lubricant testing facilities and technical aid with bearing lubrication problems are another means by which Fafnir helps insure optimum performance for bearing users.

Branch Offices: Atlanta\* • Baltimore • Boston (Cambridge)\*  
Charlotte\* • Chicago\* • Cincinnati • Cleveland • Dallas\*  
Denver\* • Detroit\* • Houston • Indianapolis • Kansas City\*  
Los Angeles\* • Memphis\* • Milwaukee • Minneapolis\*  
Moline • New Orleans (Metairie) • New York (Woodside)\*  
Philadelphia\* • Pittsburgh\* • Portland, Ore.\* • Rochester  
San Francisco (Millbrae)\* • St. Petersburg, Fla. • Seattle\*  
\*Includes Warehouses

## OVER 5000 ELECTRIC MOTORS PROVIDE BALL BEARING PROVING GROUNDS AT FAFNIR



A few of the 5000 and more electric motors in Fafnir's six plants. Motors range from fractional horsepower types to 40 hp units such as that pictured at right. They provide ideal proving grounds for Fafnir electric motor ball bearings and bearing refinements.

Six "plants-full" of electric motors — over 5000 in all — make ideal proving grounds at Fafnir for electric motor ball bearing designs and new bearing refinements.

Used to power all types of equipment from pumps to 100,000 rpm grinders, and ranging in size from 1/20 to 40 hp units, these motors provide bearing performance records covering virtually every type of service and operating condition.

Fafnir's electric motor bearing proving grounds are also ideal for testing bearing refinements — new seal constructions, for example. Such widely known developments as Fafnir's contact-type Plya-Seal and slinger-type Mechani-Seal were exhaustively tested before their introduction. Their industry-wide acceptance has long since proven the value of proving grounds for ball bearing testing at Fafnir.

## NEW OFFICE FOR FAFNIR'S MILWAUKEE STAFF

A new and larger home for Fafnir's Milwaukee staff — and a more efficient headquarters for bearing service to area industry — became a reality recently with the opening of Fafnir's new office at 711 West Capitol Drive in Milwaukee.

The new office will enable Fafnir to improve its service to customers throughout the Milwaukee sales district, a territory covering half of

Wisconsin, Upper Michigan, and a section of Northern Illinois.

The move is the latest of several such improvements in Fafnir's sales and service network, which now includes 26 branch offices and 18 warehouses — plus over 1000 authorized distributors for replacement bearings.

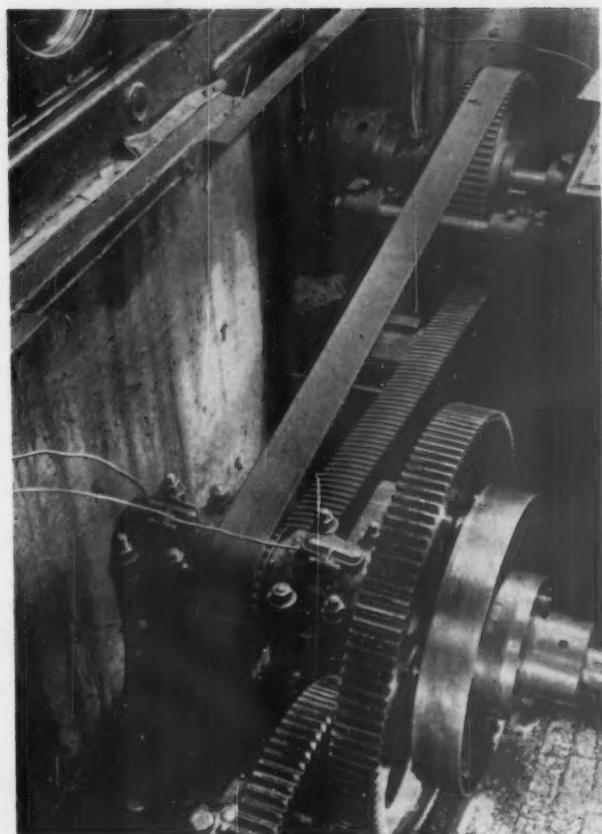
The Fafnir Bearing Company, New Britain, Connecticut.

**FAFNIR**  
**BALL BEARINGS**

MOST COMPLETE LINE IN AMERICA

For More Information Write No. 532 on Inquiry Card—Page 34

PURCHASING



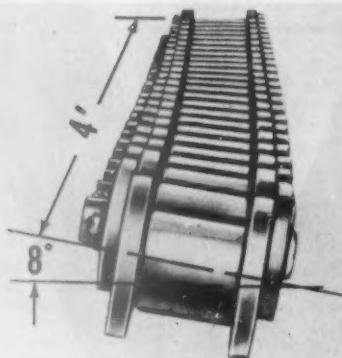
V

**Power  
Transmission**

A

**V  
A**  
VALUE ANALYSIS

## Power Transmission



### Heavy Duty Chain Cuts Field Service

Tuf-Flex roller chain in construction equipment drives means significant reductions in field repairs, contractors report. Extra clearances between linkplates and between pins and bushings permit 8 deg. twist which lets chain accommodate sprocket misalignment and reduces stiffness after idleness and exposure to mud, sand, and weather. Made by Diamond Chain Co., chain transmits loads in a direct line to provide greater capacity and withstand higher shock and peak loads.

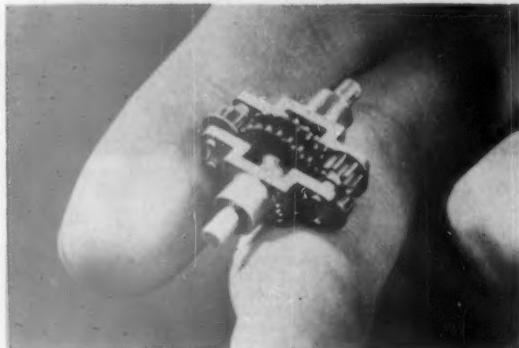
WRITE NO. 533 ON INQUIRY CARD—PAGE 34



### Air Cylinder Insures Gate Operation

Getting power to a hopper gate in spite of heavy accumulations of dirt and dust used to be a constant problem at the Howard Fertilizer Co., Orlando, Fla. Now the actuating mechanism uses a Schrader air cylinder which has functioned without failure for several years. When the gate clogs, the operator simply works the air-valve handle. The cylinder rapidly opens and shuts the gate, cutting up and clearing the stoppage.

WRITE NO. 534 ON INQUIRY CARD—PAGE 34

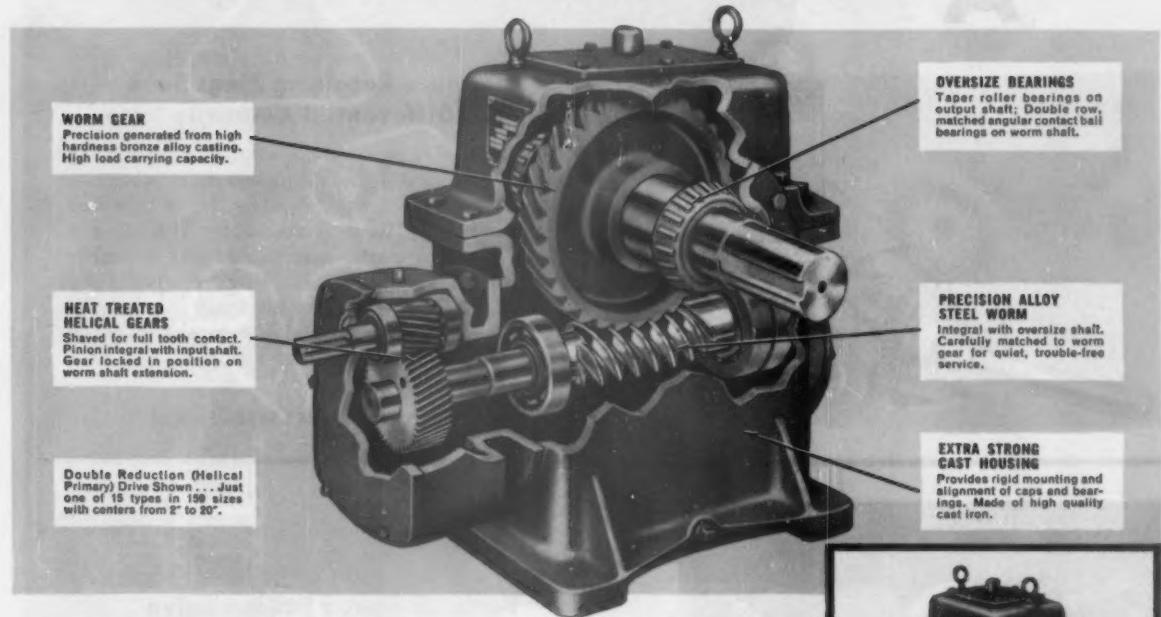


### Die Cast Differentials Save Over 95%

A leading toy manufacturer is saving over 95% of the cost of differentials by using Gries Reproducer Co. die cast differentials. The new units, developed for light load applications which do not need high precision performance, cost less than 10 cents a piece, compared to about \$4 for government surplus. Made by high speed automatic techniques, the differentials are used in place of complicated gear trains.

WRITE NO. 535 ON INQUIRY CARD—PAGE 34

# From the ONE COMPLETE LINE of Power Transmission Drives....



## FOOTE BROS. WORM GEAR REDUCERS DELIVER DEPENDABLE RIGHT ANGLE POWER

Gearing is the heart of any drive... and because more than 100 years of successful gear design and manufacturing experience go into every Foote Bros. Worm Gear Drive, they have built an unequalled reputation for performance, durability, and operating economy. Foote Bros. Worm Gear Drives are widely used

in every industry in applications where dependability is a primary need. If your drive problems involve right angle, concentric shaft, parallel shaft, or shaft mounted transmission of power, check the advantages of the complete Foote Bros. Power Transmission Line.

## NOW! RATED TO LATEST AGMA STANDARDS



Foote Bros. Worm Gear Drives are rated to the latest AGMA Standards. A new Catalog—HGB—just off the press, illustrates and describes Foote Bros. Worm Gear Drives. Ask your nearby Authorized Foote Bros. Distributor for a copy, or write today.

**FOOTE BROS.**



**GEAR AND MACHINE CORPORATION**

4581 South Western Boulevard, Chicago 9, Illinois

**POWER TRANSMISSION DRIVES**

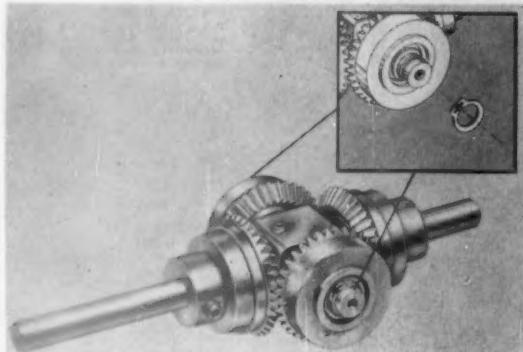
For More Information Write No. 536 on Inquiry Card—Page 34

MAY 23, 1960



FAN-COOLED SINGLE REDUCTION DRIVES  
AVAILABLE FOR HORIZONTAL OR VERTICAL MOUNTINGS.

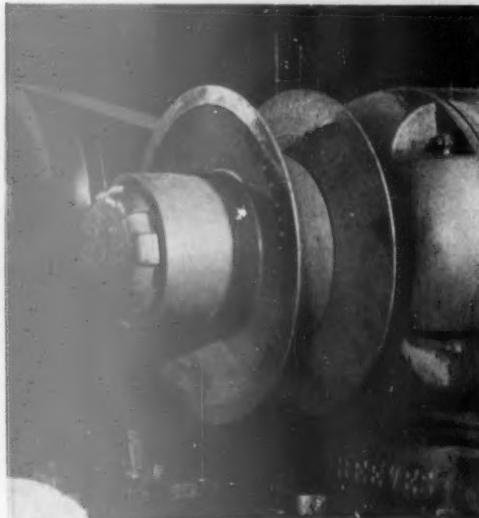
## Power Transmission



### Miniature Retaining Rings Save 97% in Differential Assembly Time

By using Series 5100-15 miniature retaining rings on its Model D-155 precision differential, Dynamic Gear Co., Inc., Amityville, N.Y. saved 97% in assembly time. A reduction of \$3.93 per unit in costs for parts, machining, and assembly was made by using Truarc rings produced by Waldes Kohinoor, Inc. The accuracy of the differentials was increased and the tumbling circle of the spider gear shaft was reduced for better miniaturization.

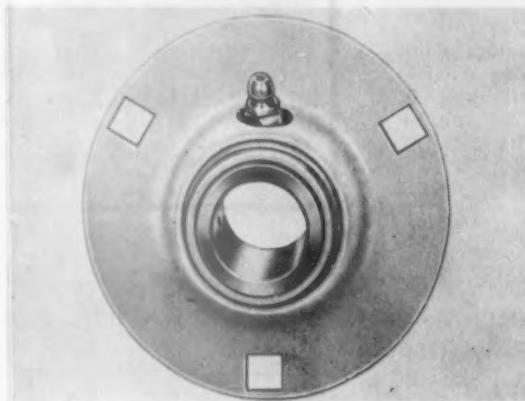
WRITE NO. 537 ON INQUIRY CARD—PAGE 34



### Variable-Speed Pulleys Solve Problem of Conveyor Line Freezing

T. B. Wood's "MS" variable-speed pulleys have eliminated the problem of freezing of conveyor line sheaves at the Mercury division assembly plant, Wayne, Mich. Some of the 21 drives that have been installed for use on subassembly conveyors have proven effective even when operating at 250 starts and stops per shift. No maintenance, other than periodic lubrication, is required to keep the oil reservoirs at the proper level.

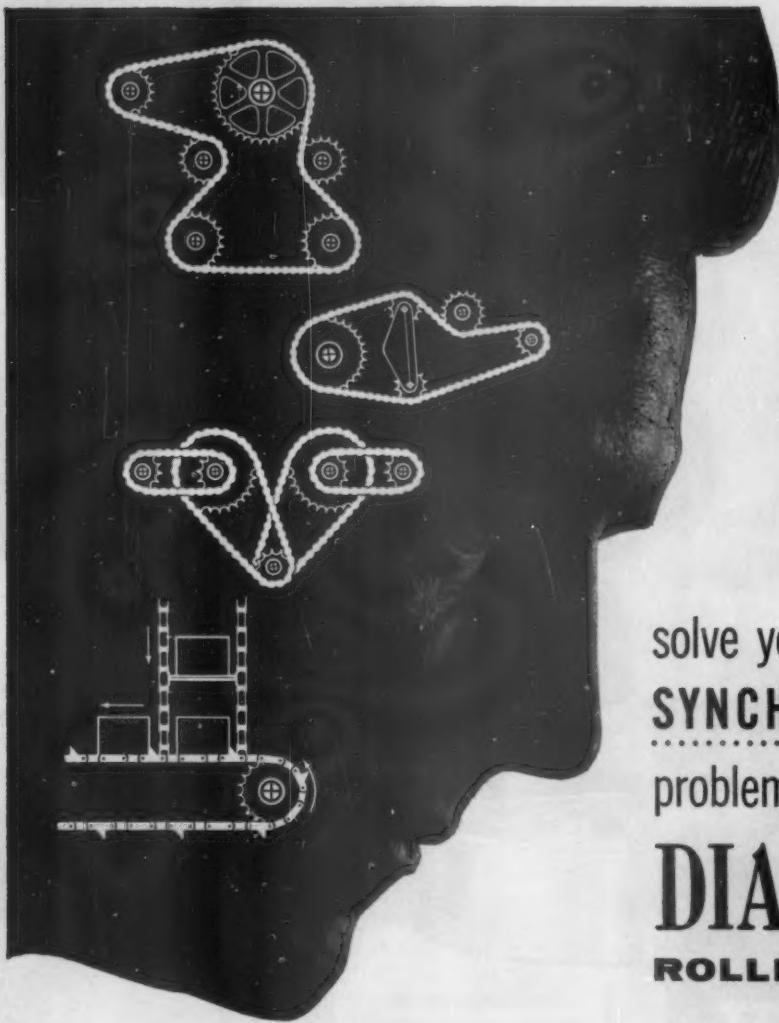
WRITE NO. 538 ON INQUIRY CARD—PAGE 34



### Sleeve Bearings Save Almost 50% Due to Low Cost, Easy Installation

Minneapolis-Moline Company, Hopkins, Minn. made a 49.2% savings by using sleeve bearings instead of ball bearings on its low-profile, self-propelled Customatic 570 combine. These Series #278 bearings, made by Randall Graphite Bearings, Inc., were also used on corn pickers and shellers because of initial low cost, easy installation, and extra-long trouble-free performance.

WRITE NO. 539 ON INQUIRY CARD—PAGE 34



solve your  
**SYNCHRONIZATION**  
problems *with*  
**DIAMOND**  
**ROLLER CHAIN**

◆ DIAMOND's precision manufacture assures uniform pitch and close total-length tolerances. That's why DIAMOND Roller Chain is ideal for accurately timed movements . . . or for synchronization of several shafts in one machine. Two or more chains may be run in parallel with perfect coordination.

**DIAMOND ENGINEERING SERVICE IS AVAILABLE.** Write, giving full details of your problem. DIAMOND CHAIN COMPANY, INC., A Subsidiary of American Steel Foundries, 402 Kentucky Avenue, Indianapolis 7, Indiana. Offices and distributors in all principal cities.

**DIAMOND** ROLLER CHAINS®

For More Information Write No. 540 on Inquiry Card—Page 34



## YOU GET COMPLETE INSPECTION WHEN YOUR "SPECS" READ HYATT

Hyatt Hy-Roll bearings are constantly checked through every stage of production. But performance is the payoff. And, that's why Hyatt insists . . . without exception . . . that every metric series Hy-Roll bearing be run on a special fixture to check noise level as a final test for quality. It's another of the many secrets of Hyatt reliability. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

Replacement bearings available through United Motors System and its authorized bearing distributors.

**HYATT HY-ROLL BEARINGS**

IN ROLLER BEARINGS HYATT IS THE WORD FOR RELIABILITY



**V**

## Power Transmission

VALUE ANALYSIS

**A**

### Adhesive Bonding Reduces Assembly Time for Small Pinion Timing Gears

By adhesive bonding small pinion gears to rotor shafts in assembling timing gears, General Time Corporation, Torrington, Conn. saved \$56.37 per thousand. Using EC-1386, a high-strength adhesive with an epoxy resin base made by Minnesota Mining & Mfg. Co., the company reduced rejects distorted by the heat of brazing, permitted design modification to eliminate secondary operations, and eliminated the need for 100% inspection for shaft distortion.

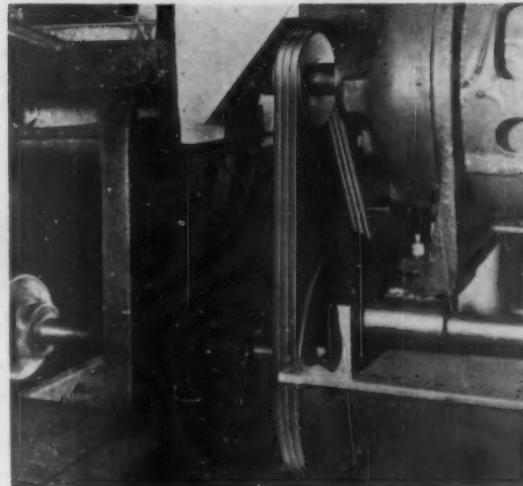
Write No. 418 on Inquiry Card—Page 34



### High Capacity V-Belt Drives Cause 68% Savings in Aisle Space

A 68% savings in aisle space at the end of each line of screw-threaders was made at Screw & Bolt Corporation of America, Southington, Conn. with the use of compact Gates Super HC V-belt drives. In addition, the total cost of the eight high capacity drives was \$168 less than the replacement cost of the conventional kind. The weight of the high capacity drives is also 11 pounds less than conventional drives—making a 25% savings.

Write No. 419 on Inquiry Card—Page 34

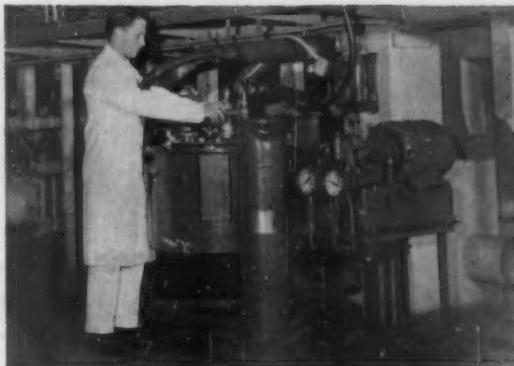


### Centrifuge Drives Boost Production Without Redesign of Machines

Oilgear "any speed" centrifuge drives have stepped up production from 33% to 85% at the plant of a leading manufacturer. Without redesign of machines, optimum speeds were determined and cycle times reduced. The manufacturer was able to get more efficient separation, clarification, classification, thickening, dewatering, impregnating, enameling, and galvanizing.

Write No. 420 on Inquiry Card—Page 34

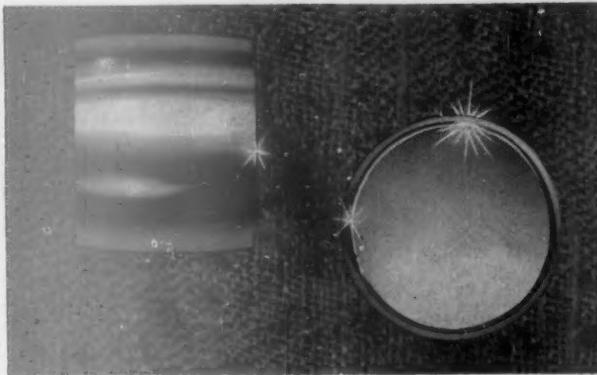
For More Information about ad on facing  
←page Write No. 421 on Inquiry Card—pg. 34



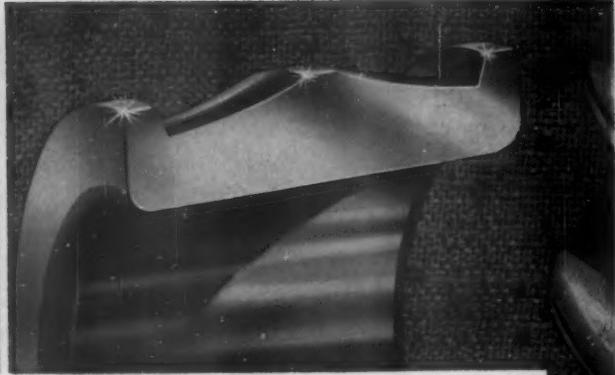
News! The best features of modern bearing design combined

# Spherical

## SELF-ALIGNING ROLLER BEARINGS BY LINK-BELT



**BIG, HIGHEST-CAPACITY ROLLERS.** Each bearing has a maximum number of rollers—as large as possible, yet all components are in optimum balance. Precision-ground to extreme accuracy, these convex rollers offer maximum economy for all applications.



**HIGH, HEAVY INNER RACE FLANGES.** Hefty inner race has sturdy shoulders which offer convenient hold for assembly and removal of bearing. They end problems of cutting away shaft or applying pressure at outer race . . . avoid any need to skimp on shaft shoulders.

**B**IG, mirror-smooth convex rollers *plus* heavy, broad-shouldered inner race *plus* centrifugally-cast bronze, precision-machined retainer! Only from Link-Belt do you get ALL that is best in bearing design.

Individually, these elements represent major improvements on accepted design concepts. Collectively, they constitute the most efficient spherical roller bearings available . . . promise unequalled economies, whatever the application. Men who know bearings will readily rec-

ognize new contributions to capacity, endurance and ease of maintenance.

For the good of your equipment, take time for a feature-by-feature comparison with any bearings you're now using. Your Link-Belt office or authorized stock-carrying distributor will gladly explain the many performance advantages evolved with this new design. And either can furnish full data on industry's most complete line of ball and roller bearings . . . pillow blocks and flanged, flanged cartridge, cartridge and take-up blocks.

**LINK** •  **BELT**

MANUFACTURER OF SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarborough (Toronto 13); Brazil, São Paulo; Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

14,618

and refined in



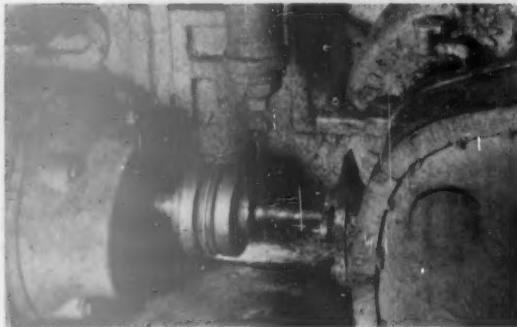
**PRECISION-MACHINED, CENTRIFUGALLY-CAST BRONZE RETAINERS**  
offer many times more support and ability to withstand high stress.  
They are not stampings—they space rollers accurately under extreme  
speeds and loads. Independent cage action for each row of rollers  
assures maximum bearing efficiency.

For More Information Write No. 541 on Inquiry Card—Page 34

MAY 23, 1960

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## Power Transmission



### Coupling Reduces Shock & Vibration Of Machines at Paper Plant

A No. 6 "sure-flex" coupling made by T. B. Wood's Sons Co. cut down the shock and vibration of machines at the Schmidt & Ault Paper Company plant, York, Pa. It consists of two flanges connected by a two-piece flexible rubber sleeve. The teeth of the sleeve halves lock into the teeth of the flanges, tightening under torque to provide smooth transmission of power. The coupling runs quietly and requires no lubrication.

WRITE NO. 422 ON INQUIRY CARD—PAGE 31



### Miniature Ball Bearings Improve Missile Potentiometer Reliability

By replacing two single row instrument bearings mounted in duplex (containing a precision spacer and separate guide roller) with a New Departure double row high precision ball bearing with integral outer race guide roller, large savings were made on Nike Ajax and Hercules missile ground support potentiometers. The savings were a result of less difficult and less costly hand assembly of shaft and parts. At the same time, the miniature ball bearing improved potentiometer's reliability.

WRITE NO. 423 ON INQUIRY CARD—PAGE 34



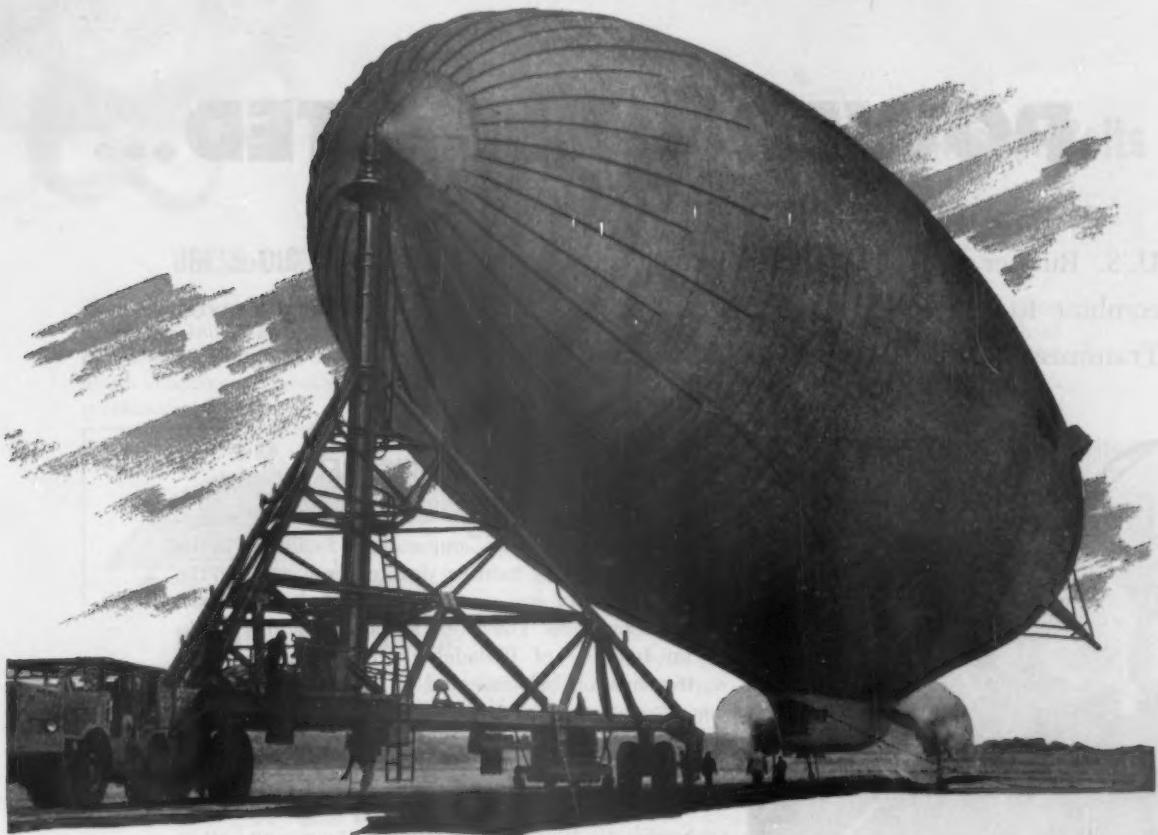
### All-Synthetic Belting Keeps Full Power and Grip After Four Months

A manufacturer that quarries rock and grinds it to powder for insulation found that Texalon all-synthetic belting runs in perfect condition even after four months of continuous use. Previously, with "D" section V-belts there had been some slip and loss of power. Through slide rails, up to eight inches of adjustment can be made in the belting.

WRITE NO. 424 ON INQUIRY CARD—PAGE 34

# "Hitching Post" for Navy Blimp!

uses a 19-foot Saginaw  $\frac{1}{2}$  Screw!



A Saginaw Ball Bearing Screw is located in the vertical column of these telescoping Goodyear Blimp Mooring Masts! The screw's extremely low friction and rapid positioning ability synchronizes the mooring fixture with the nose of the blimp to quickly and safely secure the Navy craft.

The huge high-efficiency Saginaw b/b Screw used here is over 19 feet long and with a B.C.D. of 6 inches. From the tiniest Saginaw Screw used in instrumentation, to this giant used in the Goodyear Mooring Mast, the principle of the Saginaw Ball Bearing Screw is almost universally adaptable. Its ability to replace acme screws and

hydraulic devices with over 90% efficiency has already assured smoother, more dependable actuation for over 5,000 satisfied customers!

The Saginaw Screw may be able to improve your product's performance, give you greater power and maintenance savings, and lower your initial cost. Talk your actuation problem over with Saginaw's engineers. Just write or phone Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—world's largest producers of b/b screws and splines.

**Actuation To Fit Your Individual Requirements**  
Have been built as small as  $\frac{1}{16}$  in. B.C.D. and  $\frac{3}{4}$  in. long, as large as 6 in. B.C.D. and 40 ft. long. Larger sizes can be built to your order.

**WORLD'S MOST EFFICIENT ACTUATION DEVICE**



For More Information about ad on following page Write No. 543 on Inquiry Card—pg. 34→



TRANSMISSION BELTS from the Power Unlimited complete belt line

# POWER UNLIMITED...

U. S. Rubber's research, development and manufacturing facilities all combine to produce Endless Transmission Belts that fulfill every Power Transmission need. For example:



## U.S. PowerGrip "TIMING" BELT

These belts, invented by "U.S." research and manufactured by the "U.S." unparalleled facilities (in the only plant in the industry devoted exclusively to the production of endless transmission belts), are patented products. They were acclaimed by the Franklin Institute of Philadelphia the greatest power transmission belt invented in this decade.

PowerGrip "Timing"® Belts never stretch. They require no lubricating or maintenance. Operating without tension, they prolong the life of bearings. They are used on drives from fleapower to 1,000 hp. Speeds are from imperceptible to the eye and up to 16,000 f.p.m.

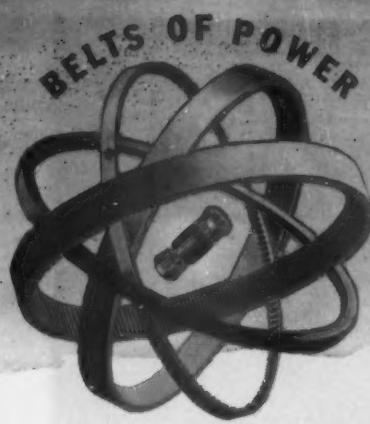
## U.S. ROYAL V-BELTS

U. S. Royal V-Belts, with 40% greater H.P., are made by entirely advanced automation and curing processes.

They are unequalled for service on multiple transmission drives. Their *unmatched* matchability makes this an undisputed fact. This has been proven in actual plant use in all parts of the country—on the West Coast (Ranchers Cotton Oil Co., Fresno, Calif.), the East Coast (The Ruberoid Co., Gloucester City, N. J.), and in a New England paper-making plant, to point out a few.

The instant matchability of U. S. Royal V-Belts in any size up to 180 inches saves you dollars in Time and dollars in INVENTORY. ASK YOUR U.S. TRANSMISSION DISTRIBUTOR TO EXPLAIN THE FULL MEANING OF THIS TO YOU.

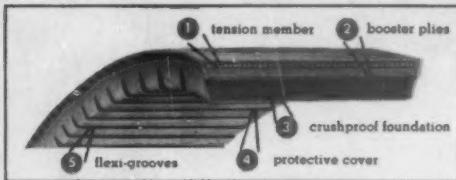




## the only complete line of Transmission Belts

### PRESS-CURED V-BELTS

The U. S. Royal line, of course, includes sizes larger than 180". These giant size V-belts are built by a new "U. S." process that practically eliminates length variation and greatly reduces belt matching problems.



### VARIABLE SPEED BELTS

This Belt is non-squash, non-sag. This is the belt to do away with Variable Speed Belt problems. Hard, rigid rubber encloses soft rubber containing tension members. The *exclusive* and complete rigidity in these belts prevents squashing.

In plant after plant, users find that lengthwise stretch is just about non-existent. *No sagging*. This belt has complete accuracy regardless of speed changes—whether you switch from 2,000 rpm to 10.

### U. S. ROYAL SPEEDAGE KORD ENDLESS BELTS

The U. S. Speedage Kord® Endless Belts are for really high-speed service—up to 18,000 f.p.m. Thin enough to operate over pulleys as small as  $\frac{1}{2}$ " in diameter. Designed for work on open, serpentine and reverse drives. No seams, splices or laps to cause vibration. Available from stock in a wide range of popular sizes.

### SPINNER BELTS

This belt will travel up to 113 mph with no vibration, *no noise*. The reduction in the length of modern spinning machines requires a belt of this high speed. Special "U. S." construction methods make possible building of belt with a minimum of splices, regardless of length. Contamination of yarn is prevented by another unique feature: no rubber on outside surfaces. The belt for uniform twist and smooth spindle operation.

### U. S. ROYAL FLAT BELTS

U. S. Spinner Belts are only one type of belt in the U. S. Complete Flat Belt line. "U. S." produces a variety of belts for a multiplicity of services. They each feature a specially woven duck for top strength and tenacity with top-quality friction between plies.

### U. S. FLEXIBLE COUPLINGS

Misalignment, whether angular, axial or lateral, is compensated for by this coupling, most versatile ever produced. It provides torsional resilience by angular displacement and insulates both vibrationally and electronically (no metal-to-metal contact).

Design of this coupling is so free of complicated parts that cost is truly low in comparison with other couplings. It will pay you to insist on having these tried on your machinery. The result will be a very desirable reduction in maintenance costs.



**The one and only sure way to get expert transmission engineering service is through your U. S. Rubber Transmission Distributor. He stocks the only complete transmission belt line. He never attempts to make one type of belt perform where another type should be used. He is unbiased in seeing that you get the right belt for your needs.**



Mechanical Goods Division

**United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

Visit us at N.A.P.A. Convention, Los Angeles,  
Calif., May 22-25.

In Canada: Dominion Rubber Company, Ltd.

# WHY NICE.

NICE offers Product Designers . . .

Specialists, with facilities and know-how backed by more than a half century of exclusive ball bearing experience. As "specialists in specials," experienced NICE engineers take advantage of every design opportunity to reduce costs without sacrifice of quality and to improve product performance and appearance.

Of special interest now are the advantages NICE can offer through the use of the revolutionary new UNIBAL Ball Bearing. Unique in design and patented method of manufacture, this unground bearing of superior quality is being used successfully in many precision bearing applications heretofore requiring the use of conventional precision ground bearings.

NICE engineering help is available to Product Designers, whenever needed, through the factory engineering department or qualified field representatives.



**NICE BALL BEARING COMPANY**  
DIVISION OF CHANNING CORPORATION  
NICETOWN • PHILADELPHIA • PENNSYLVANIA

For More Information Write No. 544 on Inquiry Card—Page 34

**BOSTON** Gear

BOST-BRONZ® Oil-impregnated Bearings

BEAR-N-BRONZ Solid Bronze Bearings

BALL BEARINGS

SHEAVES

WHEELS

**FROM STOCK**

PILLOW BLOCKS

FLANGED CARTRIDGES

## Your best buy in BEARINGS is nearby

You can get the bearings you need faster, and save valuable production time, when you call your local Distributor for prompt delivery **FROM STOCK**. The Boston Gear Catalog lists 2546 standard types and sizes of bearing products.

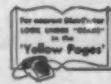
You buy at factory prices, and you save still more — up to 45% — when you order

BOST-BRONZ or BEAR-N-BRONZ in the popular "Bearing Bank" assortments (right).

Your nearby Distributor will show you how to get the full benefits of Boston Gear standardization — in lower costs, in easier maintenance, in simplified servicing. Boston Gear Works, 67 Hayward Street, Quincy 71, Massachusetts.

CALL YOUR  
NEARBY

**BOSTON** Gear®  
DISTRIBUTOR



**— STANDARDIZATION PAYS —**

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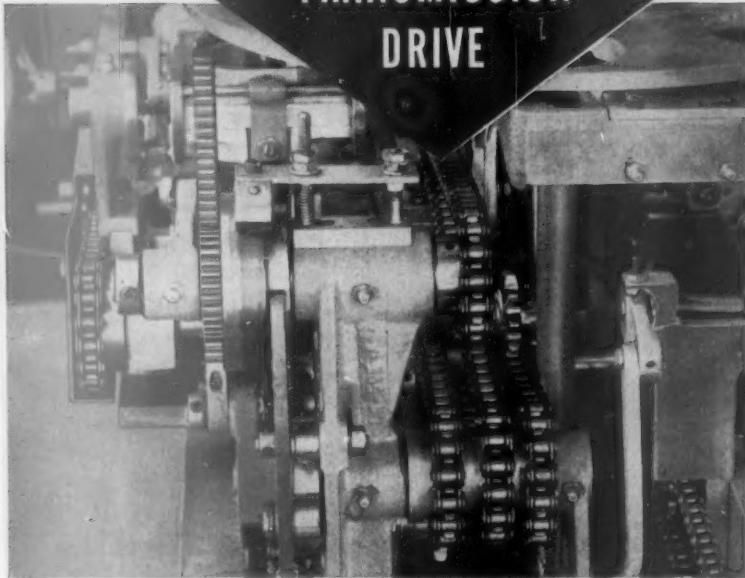
MAY 23, 1960

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## HOW TO GET

OVER 98% +  
EFFICIENT  
SERVICE FROM  
YOUR POWER  
TRANSMISSION  
DRIVE



ACME Chain Drives deliver over 98% of the power furnished by the driving sprocket. There is practically no loss of ratio of energy between driving and driven members. They reduce costly production and maintenance time and are easily installed.

ACME Chains are ruggedly built of hardened steel, heat treated according to specific requirements of each part, to assure long service with a minimum of maintenance . . . vital to maximum production. Be sure to get more for your chain dollar by specifying ACME Chains. They are available in all sizes from  $\frac{1}{4}$ " pitch to  $2\frac{1}{2}$ " pitch.

*Call your nearest ACME CHAIN Distributor. He has the full cooperation of our Engineering Department.*



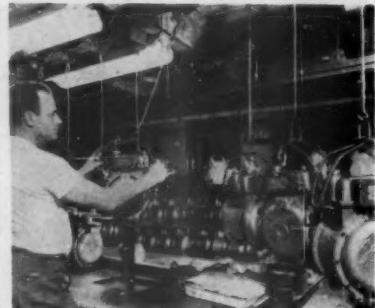
Write Dept. 37-A  
for new 100-page  
illustrated technical  
catalog including new  
engineering section  
showing 36 methods of  
chain adjustments.



COMPLETE LINE OF ROLLER CHAINS AND SPROCKETS • DOUBLE PITCH CONVEYOR CHAINS • STAINLESS STEEL CHAINS • CABLE CHAINS • FLEXIBLE COUPLINGS • STANDARD AND SPECIAL ATTACHMENTS

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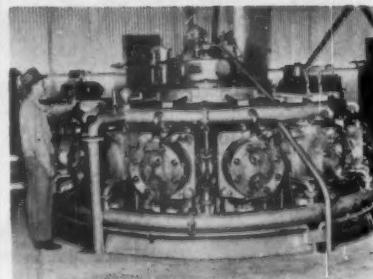
## Elevator Platform Lifts Meters at Touch of Pedal



A small elevator platform, built into the bench top and driven by a single-acting air cylinder, lifts gas meters from a bench to an overhead conveyor line so that a workman at Sprague Meter Co., Bridgeport, Conn. can use both hands to secure the conveyor hooks. At a touch of a pedal, the cylinder piston raises the meter to a pre-set height. Once the meter is hooked in place, the operator removes his foot from the pedal and the platform—built by Scoville Manufacturing Company—drops back to the bench level.

Write No. 719 on Inquiry Card—Page 34

## Solid Aluminum Bearings Reduce Weight in Engines



After having used babbitt-lined bronze bearings in its radial engines, Nordberg Manufacturing Company changed to the solid aluminum type made by Alcoa because of better all-round characteristics and lighter weight. Light weight was of particular importance in the master bearing since it oscillates while the crankpin rotates at 400 rpm. Using B750-T5 aluminum bearing alloy, the bearing's weight was kept to about 715 pounds and the centrifugal force reduced to a minimum.

Write No. 720 on Inquiry Card—Page 34

# NEW SPICER TWO-PLATE CLUTCH LINE DESIGNED FOR HIGH SPEED, HIGH TORQUE ENGINES!



New Spicer 11" 2-plate Clutch

Spicer heavy-duty 13", 14" and 15½" 2-plate clutches have for years been taming high torque loads on the most powerful automotive power plants built. Now this pioneering know-how has been used to develop a complete range of 2-plate clutches from 8½" to 12", in addition to the already established 13", 14", and 15½" units.

The new Spicer 11" 2-plate clutch, now in production, is designed for vehicles with GVW's up to 60,000 pounds, and engines in the torque range from 300-400 pounds/feet.

The new range of Spicer 2-plate clutches will reduce inertia, lower release effort by 40%. Built-in parallelism guarantees uniform pressure across entire surface of pressure plate, regardless of wear or adjustment. Reduced peripheral speeds offer greater resistance to burst.

The new clutches will be smaller, lighter in weight, yet have greater facing area for increased clutching efficiency.

Spicer two-plate clutches are available in damper, rigid or cushion disc design with riveted, bonded or ceramic type facings.

#### Comparative Design Information

	11" 2-Plate	14" Single Plate
Facing O.D.	11"	13.875"
Facing I. D.	7"	8"
Facing Area (per facing)	56.55 sq. in.	100.8 sq. in.
Total Facing Area	226.2 sq. in.	201.6 sq. in.
Mean Radius	.375 feet	.456 feet
Plate Load	1750 lbs.	2880 lbs.
Torque Capacity	656 lb. ft.	656 lb. ft.

Write today for complete information on the new line of Spicer 2-plate clutches.



**DANA**  
CORPORATION  
Toledo 1, Ohio

**SERVING TRANSPORTATION** — Transmissions  
Auxiliaries • Universal Joints • Clutches • Propeller  
Shafts • Power Take-Offs • Torque Converters  
Power-Lok Differentials • Gear Boxes • Forgings  
Axles • Stamping • Frames • Railway Drives

Many of these products are manufactured in Canada by Hayes Steel Products Limited, Merriton, Ontario  
For More Information Write No. 547 on Inquiry Card—Page 34

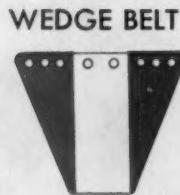
An important Worthington message about

# THE COMING CHANGEOVER FROM

Recently you may have seen a number of announcements promising "super" V-belt drives that are considerably smaller and less expensive. What these manufacturers are talking about, of course, is the new Wedge belt which will soon replace conventional V belts for new belt



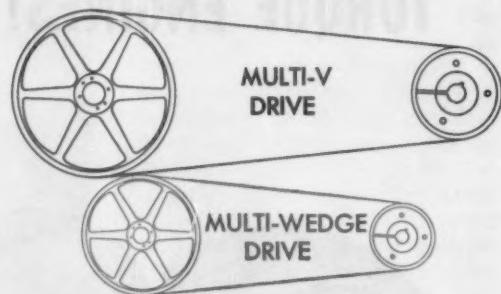
V BELT



WEDGE BELT

## Q. What is a Wedge belt?

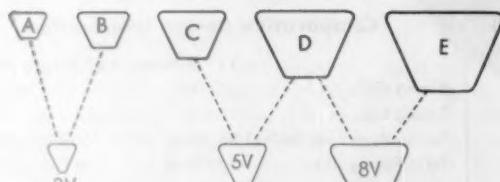
A. The cord layer near the top of a V belt carries the load. This layer, however, is only efficient in the portion supported by side walls (red areas). Because it is more of a pie shape, a Wedge belt increases the overall efficiency of a V belt. The Goodyear Tire and Rubber Company (manufacturer of Worthington-Goodyear V belts) was the first to offer a Wedge belt (in 1948). This fine product, however, was sold primarily for automotive applications.



## Q. What are the advantages of Wedge belts?

A. Smaller size, lower cost. Because the new Wedge belts are more efficient, you need fewer belts and smaller sheaves to carry the same horsepower load. Sheave diameters can be reduced 30 to 50%. Center distances can be cut 20%. And initial cost can be as much as 20% less.

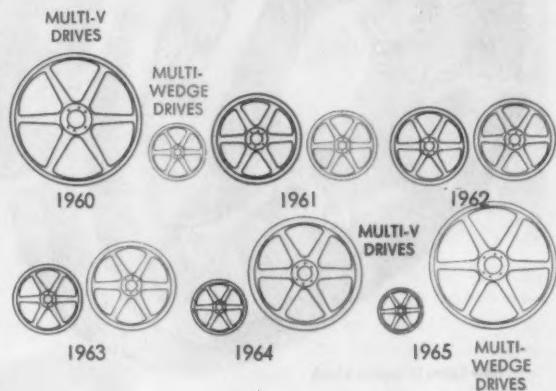
## V BELT SECTIONS



## WEDGE BELT SECTIONS

## Q. What belt sizes will be available?

A. Since the smaller Wedge belt does more work than the other V belt, it has been possible to reduce the number of sizes without loss of flexibility. The new Wedge belts will be available in three standard sections, 3V, 5V and 8V. The new nomenclature simplifies identification. The 3V belt is three eighths of an inch in width (measured at the top); the 5V belt is five eighths; the 8V belt, eight eighths, or one inch. Stock 3V and 5V sheaves will cover horsepower ranges up through 200 hp. Made to order 8V sheaves will be used for 200 to 2,000 hp. requirements.



## Q. Will multi-V drives continue to be available?

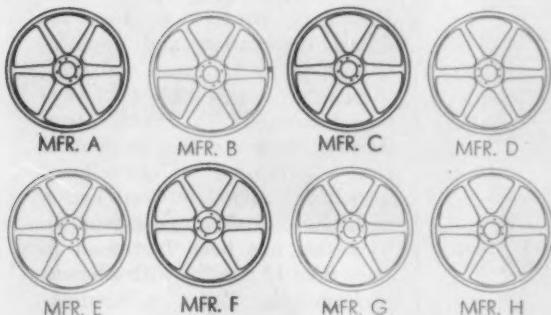
A. Worthington has no intention forcing any customer to switch to the new Multi-Wedge drive. The choice is up to you. We will continue to manufacture and stock both drives as long as there is a demand for both. We expect that many customers will need replacement belts and sheaves for Multi-V drives for many years. The chart above indicates how we expect the market to be divided in the years ahead.

# MULTI-V TO MULTI-WEDGE DRIVE

drive applications. On these pages Worthington—maker of the QD (Quick Detachable) sheave, the industry's largest seller—explains the significance of the coming change-over. If you would like more information please write to Worthington Corp., Section 79-25, Oil City, Pa.

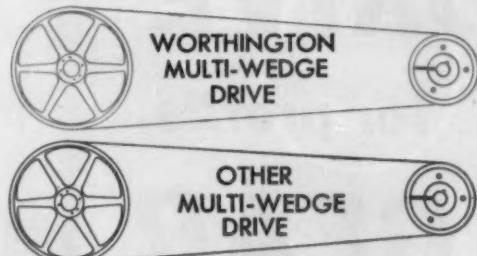


WORTHINGTON



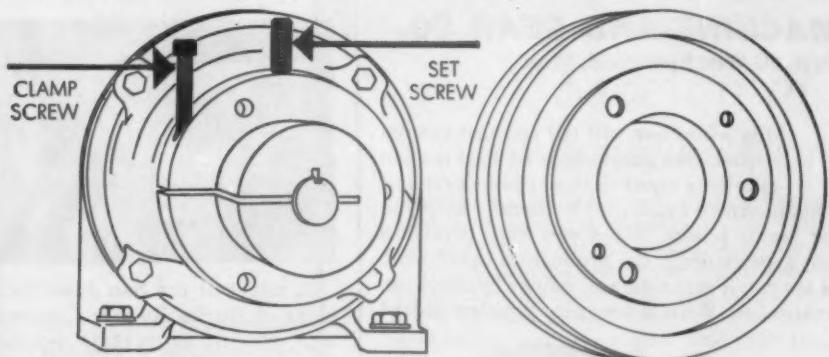
## Q. Will all drive manufacturers make the changeover?

A. All indications are that the majority of Multi-V drive manufacturers are going to switch to the new Wedge belts. Of the eight leading builders, five (including Worthington) now also offer Multi-Wedge drives.



## Q. Will different brands be interchangeable?

A. So far all Multi-Wedge drives introduced are being offered in the same belt and sheave sizes. Since Worthington and its QD licensees enjoy the largest share of the market, you can be doubly sure of having a dependable source of supply if you buy your Multi-Wedge drives from Worthington. All stock QD sheaves are being built to standardized dimensions by all QD manufacturers and are therefore interchangeable.



## Q. Are all Multi-Wedge drives alike?

A. Whether you buy a new Multi-Wedge drive or the older Multi-V drive, the major difference between brands will be the quality of the belt and the method of locking the hub to the shaft. Worthington QD (Quick Detachable) sheaves, with their two Golden Screws are preferred by plant operators because of their positive locking arrangement.

The clamp screw simplifies installation and assures permanent alignment. You can install QD sheaves one part at a time. No heavy rim and

hub combination to inch delicately into place. If change in speed is required, you simply install another sheave on the hub which remains anchored to the shaft. The clamp screw is an exclusive Worthington feature.

The set screw prevents "key drift." It locks the key securely in place, avoiding the danger of the key drifting off and becoming a safety hazard. Because of the exclusive clamp screw it is possible to use a set screw without causing hub distortion that might cause eccentric runout.

For More Information Write No. 548 on Inquiry Card—Page 34

Snap-ring grooves in this 12" O. D. thin-section Reduction Drive Gear are machined before carborizing and hardening. Both spline and gear teeth are ground and held to .001" eccentricity after hardening the entire gear.

**When you  
DRIVE  
for profits,  
GEAR  
with**



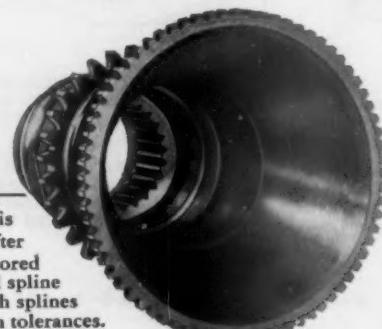
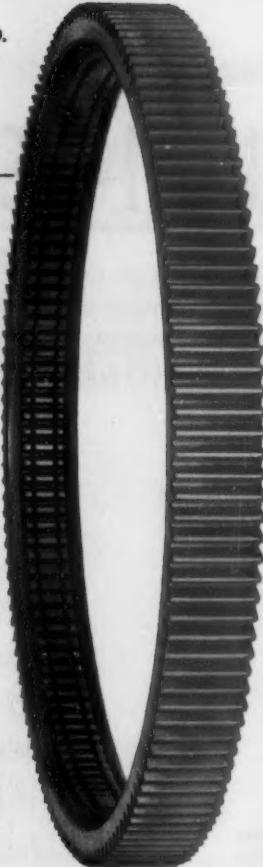
**PERKINS**  
**MACHINE AND GEAR CO.**  
Dept. 4G West Springfield, Mass.

This Handy Gear Calculator, easy to use, saves time. Folder illustrating Perkins custom precision gears and facilities offers information. Both yours on request.

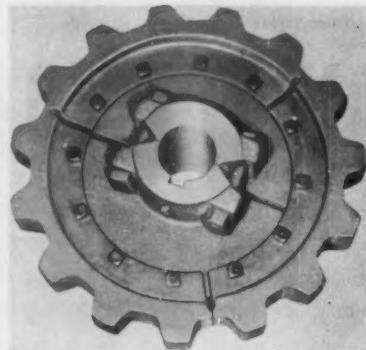


Most machining operations on this Drive Gear Shaft are performed after localized hardening with the cored areas at Rockwell C42. External spline and gear teeth are ground with splines held to precision tolerances.

For More Information Write No. 549 on Inquiry Card—Page 34



**Segmental Rim Sprockets  
Provide Longer Life**



Brunswick Pulp and Paper Company, Brunswick, Ga., reduced installation and replacement time on the head and shaft sprockets of its number 13 conveyor from 30 to 2 man-hours through the use of Rex segmental rim sprockets. Conventional sprockets previously used had a wear life of about five months. Now this has been increased to more than 12 months with efficient performance. When replacement is necessary on the new sprockets, only the segments have to be changed; the hub remains in place on the shaft.

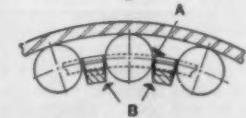
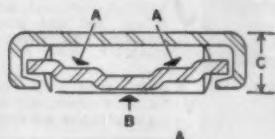
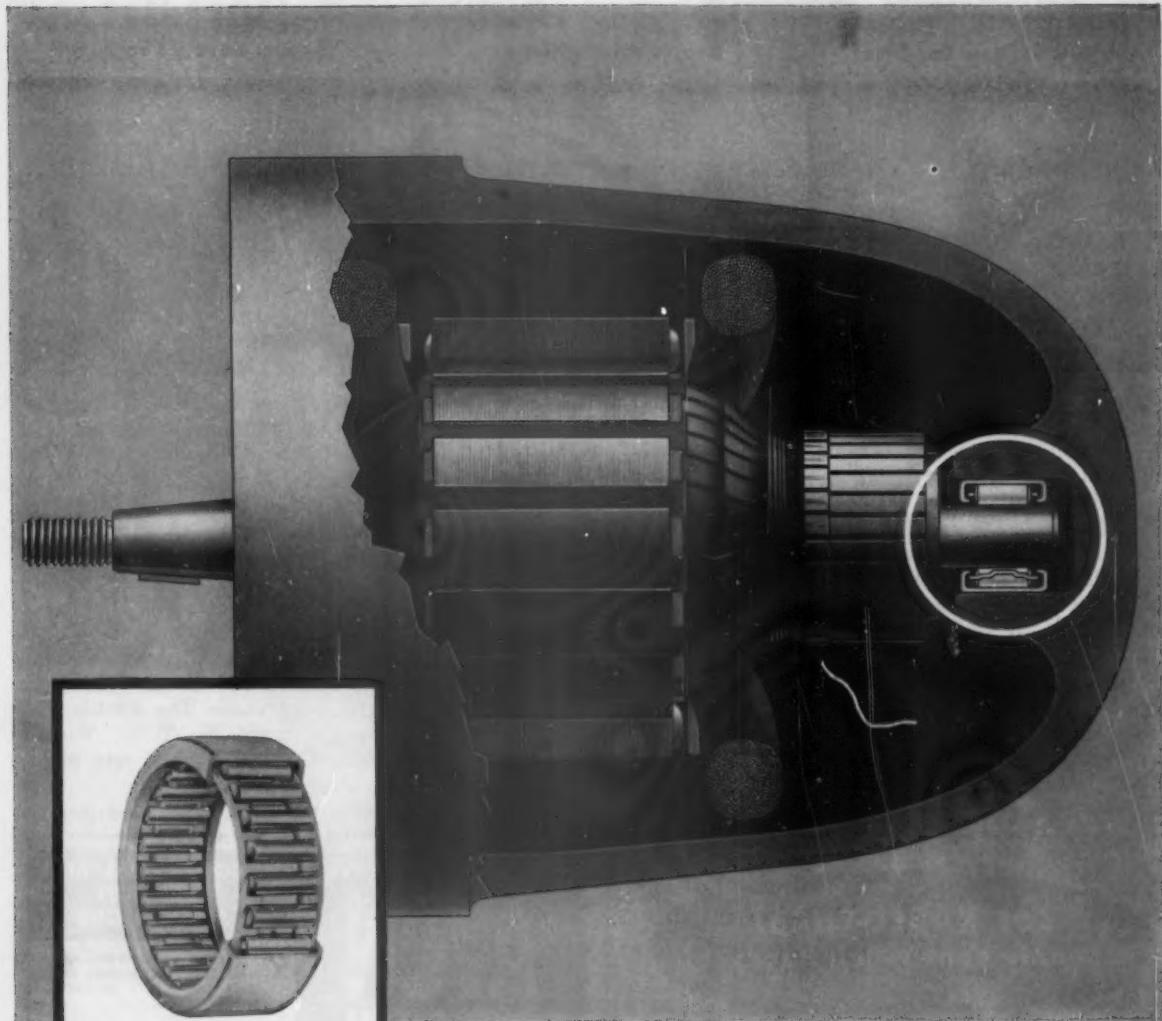
Write No. 721 on Inquiry Card—Page 34

**Flexible Couplings Help  
Operate Two-Speed Mixer**



A mixer at the San Jose, Calif. plant of Burke Rubber Company was difficult to operate because it had to be driven alternately by two electric motors—one of 75 hp at 420 rpm and the other of 125 hp at 585 rpm. By installing two PX22 Dodge Para-Flex flexible cushion couplings between shafts of the two motors, the company saved about 30 hours of installation time. The couplings also absorbed both motor end float and shock at times of shifting from one speed to the other.

Write No. 722 on Inquiry Card—Page 34



- rollers end-guided at pitch line (A)
- shaft-riding retainer (B) designed to permit lubricant circulation
- high capacity in small cross section (C)
- long pregreased life
- efficient at high speeds
- mounted by press fit
- simple housing design
- low unit cost

## *Save up to 50%* *on armature bearing costs!*

Low unit cost of the new Torrington Drawn Cup Roller Bearing reduces armature bearing cost as much as 50%. This unique bearing gives excellent service at high speed and permits prelubrication for life.

Test installations and service applications show the bearing performs efficiently at speeds up to 25,000 rpm in intermittent service of 1000 hours and more. In such service, initial lubricant lasts the life of the motor. Most applications require no seals. This, with the simplicity of housing design, contributes further to economy.

Designers are invited to evaluate the Torrington Drawn Cup Roller Bearing for such applications as generators, power tools, electric mixers, vacuum cleaners and other appliance motors where considerations of cost, speed, efficiency and light weight are paramount.

Services of Torrington's engineering staff are offered to assist you in design developments of every type of electric motor.

*progress through precision*

**TORRINGTON BEARINGS**

**THE TORRINGTON COMPANY**

Torrington, Conn. • South Bend 21, Indiana

For More Information Write No. 550 on Inquiry Card—Page 34

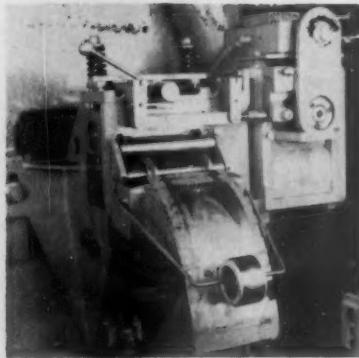
**Machining Speed Boosted  
35% With New Bar Steel**



Since changing from alloy steel to Jalcase 100—a high-strength, stress-stabilized, free-machining cold finished bar steel made by Jones & Laughlin Steel Corporation—Black & Decker Manufacturing Company, Towson, Md. has made substantial savings on shafts of electric power tools. Additional savings have been made in the production of shafts, gears, and pinions because machining speed has been increased 35%. An additional 90% reduction was made in replacement costs.

Write No. 723 on Inquiry Card—Page 34

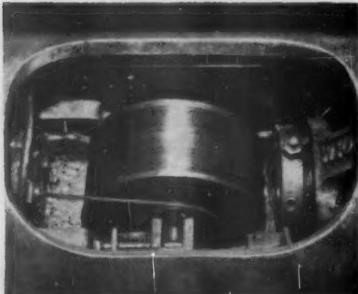
**Cam Indexed Roll Feed  
Boosts Production 41%**



A feed roll indexed by a high speed roller gear drive increased production 41% in the stamping of motor laminations at the plant of a leading manufacturer. The mechanism, built by Ferguson Machine Corporation, operates at 225 rpm with a six inch stroke—compared to 160 rpm by the previous method. Indexing components are rated for at least 8000 hours operation with maximum precision.

Write No. 724 on Inquiry Card—Page 34

**One-Piece Ductile-Iron  
Spools Save 20 to 30%**



By using spools of ductile-iron alloy 60-45-10 for stranding steel wire, John A. Roebling's Sons Co., Trenton, N. J. is saving 20% to 30% of the former cost. The five-inch spools were formerly made from high-carbon steel (0.50% to 0.60% carbon) and had crevices where the flanges join the spool barrel on which the wire would sometimes snag. This would cause production delays, spool damage, and wire waste. The ductile-iron spools, made by T. B. Wood's Sons Co., are cast in one piece, ending the snagging.

Write No. 725 on Inquiry Card—Page 34

**Let NAGEL-CHASE  
Supply Your V-Belt Pulleys!**



- Single Groove, FHP
- Strong, Welded, Pressed Steel Design
- Light Weight
- Wide Range of Standard Sizes
- 2 1/4" to 12" PD for "A" and "B" Section V-Belts
- 1/2" to 1" Bore

Original equipment manufacturers whose products incorporate V-Belt Pulleys can make substantial production savings by obtaining them from Nagel-Chase. Specialists in the production of fractional HP pulleys, Nagel-Chase has the tools and production facilities for a wide variety of standard sizes. With this elimination of tool costs and the release of production facilities for other components, manufacturers find the use of Nagel-Chase pulleys cuts production costs.

Write for complete details and specifications

**The NAGEL-CHASE MFG. CO.**

2821 North Ashland Avenue, Chicago 13, Illinois

For More Information Write No. 551 on Inquiry Card—Page 34  
400

**CONSISTENTLY PERFECT FOR COMMERCIAL AND PRECISION APPLICATIONS**

# AVON

## FINE PITCH GEARS (AND SUB-ASSEMBLIES)

✓ "Specific" for electronic equipment, control components, small tools, meters, and UNCOMPRO-MISING SPECS.

✓ SPECIAL: Internal, external, helical, and spur gear tooth grinding; also shaved tooth gears.

✓ NOTE: AVON is fully equipped for development and processing of precision sub-assemblies.

✓ Capacity range: 12 to 200 d.p., and maximum O.D. of 7½".

**AVON: A Dependable Source for Fine Pitch Cut Gears**  
AVON has every piece of most modern facility for generating consistently perfect Fine Pitch gears to your exact specifications . . . in either precision or commercial grades, standard or special . . . in ALL types, ALL classes, from ALL materials.

**SUPER FINISH:** AVON has the most modern finishing equipment available to do gear tooth grinding or shaving an internal, external, helical or spur gears. Almost unbelievable close tolerances are held for that extra touch of perfection . . . whether your order is for one piece or a million.

**INSPECTION:** AVON has the finest, modern testing and checking equipment available to assure you of micro-assembly of your most critical units.

**SUB-ASSEMBLIES:** To fully meet your engineering requirements, AVON has every AVON sub-assemblies. You get Super Micro Assembly until AVON has over fifty years aggregate engineering experience. We will be glad to work with you on any development project requiring Fine Pitch cut gearing or sub-assemblies. You can depend on AVON. Send drawings or descriptions for free estimates.

**PRODUCTION - EXPERIMENTAL - CONSULTING**

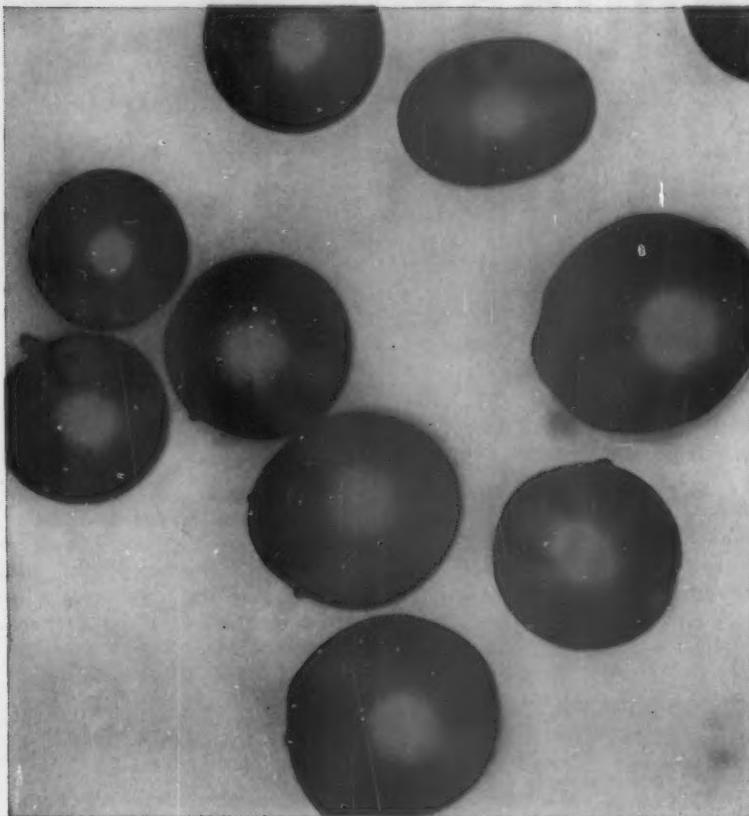
# AVON

## GEAR AND ENGINEERING CO. "The Company Geared for the Space Age"

2007 Rice Street • Melrose Park (Chicago Suburb), Illinois

For More Information Write No. 552 on Inquiry Card—Page 34  
PURCHASING

# 30 MILLION OF THESE JET-FORMED SPHERES IN EVERY INCH OF BEARING SURFACE!



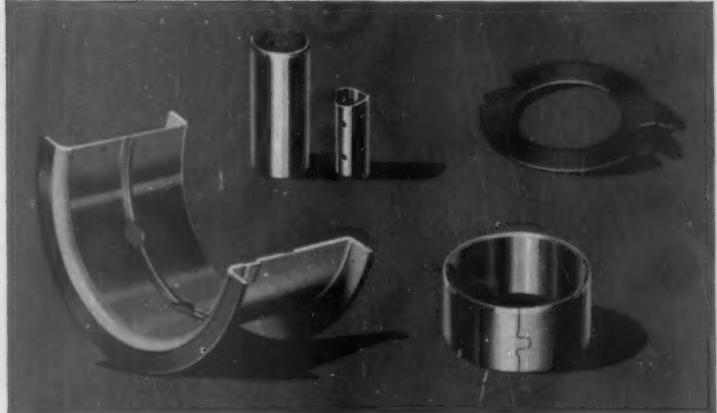
**JET PROCESS BLASTS MOLTEN ALLOY  
INTO UNIFORM PARTICLES** . . . so small that thirty million will form a thin layer only one inch square! This sintered layer is the bearing surface of Federal-Mogul sleeve bearings.

Molten copper-lead, alloyed to exact specifications, is poured into a special inert-atmosphere reaction crucible. Here it's blasted by a high-speed fluid jet to form the dense powder shown at left.

Because of the uniform particle size of this powder, the bearing surface of each F-M copper-lead sleeve bearing has precisely the same alloy composition and high adhesion to the steel backing as every other F-M bearing of the same alloy type!

**YOU CAN SEE THE CONSISTENT SIZE** in the photomicrograph. What you can't see is the consistent alloy composition which produces uniform bearing properties and performance in any alloy type.

Federal-Mogul makes engine bearings for every condition of speed and load. You can select from among five different sintered copper-lead alloys, all permanently bonded to precision-formed steel backing. Our Engineering Department is available to you for consultation or recommendations on bearing design and application. For more information, write Federal-Mogul Division, 11077 Shoemaker, Detroit 13, Michigan.



**A COMPLETE LINE!** Steel backed bearings with a selection of many different alloys for virtually any bearing application—Plain and bimetal bushes in bronze, steel or aluminum. Precision thrust washers in solid bronze, or sintered alloys on steel (one or both faces). Rolled split spacer tubes in steel, aluminum or stainless.

## FEDERAL-MOGUL

For More Information Write No. 553 on Inquiry Card—Page 34

MAY 23, 1960

sleeve bearings  
bushings-spacers  
thrust washers

DIVISION OF  
FEDERAL-MOGUL-BOWER  
BEARINGS, INC.

# Another H & S Speed Reducer on a tough job . . .

Built rugged for a critical rewind operation, this heavy overhung-load type H & S Herringbone Speed Reducer delivers day-in-day-out service under exacting load conditions.

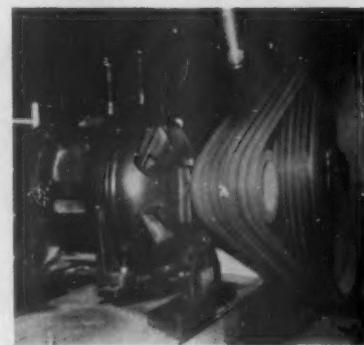
This standard unit was selected for use on a Bliss precision rewind coiling machine—where strip steel must undergo tension controlled recoiling for subsequent annealing treatment.

Notice the sturdy shaft, with heavy-duty bearings designed to take this heavy overhung load. Observe the rugged housing, made to last.

This built-in toughness typifies H & S construction—on helical, herringbone, worm and combination units.

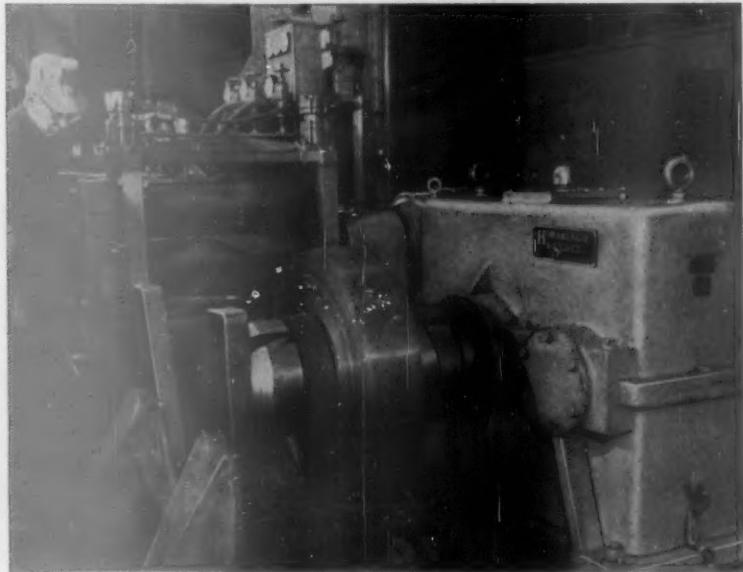
Send for detailed information on our facilities for producing a complete line of gears and speed reducers in a wide range of sizes and ratings.

Cradle-Type Motor Base  
Eliminates Belt Slippage



A food processing company reduced the squeal of a belt drive between a 30 hp electric motor and a two cylinder compressor by installing a cradle-type motor base supported on built-in slide rails with screw take-up. The base, an Econ-o-Matic made by American Pulley Co., automatically tensions the belts to the correct amount and eliminates belt slippage. The base also decreased maintenance time and operating costs by practically doubling belt life and producing the proper amount of tension.

Write No. 726 on Inquiry Card—Page 34



Heavily loaded pay-off reel being driven by H & S Speed Reducer in plant of The Acme Steel Company, Chicago.



**H&S** The HORSBURGH & SCOTT CO.

5112 Hamilton Avenue • Cleveland 14, Ohio

Specializing in fast production of quality Speed Reducers and Gearing to meet custom requirements.

For More Information Write No. 554 on Inquiry Card—Page 34

Air Motor Turns Out  
600 units/hour



A heated-handle ice fishing rod made by Vapor Chemical Co., Rives Junction, Michigan is a boon to winter fishing. And this special machine built by Schreuder Machine & Tool Co. of Jackson for Vapor Chemical helps keep cost low. The machine built around four Bellows-Locke Drill Units, a Bellows Air Motor, Hydro-Check in-line unit, and a Bellows Air Motor turns out 600 finished rod handles an hour.

Write No. 727 on Inquiry Card—Page 34



## PAYOUT ... tons at a gulp on Bower Roller Bearings

They call it strip mining . . . where payload is king and "don't spare the rig". Take this scraper: aided by a rugged 'dozer, it's pushloaded in mere minutes. Then, with tons of rock and earth on its back, it takes off cross-country . . . dumps the load . . . hustles back for more.

Bruising bouts like this often go on 24 hours a day, put an incredible strain on equipment and on bearings. Yet today's bearings—particularly those by Bower—more than meet the task. Their basic design advantages, coupled with fine

materials and precision manufacturing, have earned them a reputation for long service under the most severe conditions. And with rarely a shutdown for maintenance.

If you produce a product that uses bearings, specify Bower. You will find this extra measure of service in the full Bower line of tapered, cylindrical and journal roller bearings for every field of transportation and industry. Bower Roller Bearing Division, Detroit 14, Michigan.

**BOWER**  
ROLLER BEARINGS

For More Information Write No. 555 on Inquiry Card—Page 34

tapered  
cylindrical  
journal

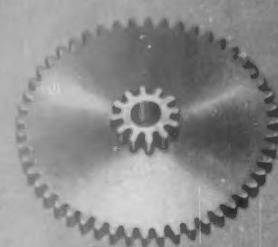
DIVISION OF  
FEDERAL-MOGUL-BOWER  
BEARINGS, INC.



SPUR GEAR, CLAMP-TYPE HUB



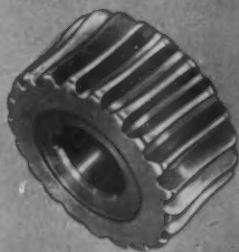
INVOLUTE SERRATION



STANDARD SPUR GEAR CLUSTER



HELICAL & SPUR  
DRIVE SHAFT



TANGENTIALLY CUT WORM GEAR

SEND FOR G.S. technical data, free! See where and how we mass-manufacture Small Gearing to uniformly fine tolerances. Folder contains 23 pictures of Small Gears, plant view, as well as Diametral and Circular Pitch Tables. Ask for your copy on company stationery, please!

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WORLD'S LARGEST EXCLUSIVE MANUFACTURERS  
OF FRACTIONAL HORSEPOWER GEARING

## an important G.S. specialty: CUSTOM HOBBING!

You see here only a few of the many, many applications of the hobbing process which G.S. performs so expertly, either manufacturing complete or cutting on furnished blanks. Whether in the medium-coarse or fine pitch ranges, we handle the simpler designs by the hundreds or the thousands—and of course, with that famous G.S. constant-quality precision which assures you of smoother production and better product performance. But we take highly specialized and complex designs in stride, too—with 42 G.S. years of top-flight experience backing up our unsurpassed production facilities, we can help in developing just the right way to do your unusual job.

If you are getting ready to launch new items or models—or if you are revamping present lines for greater efficiency and lower costs—call G.S. in to help. All we know about Small and Intermediate Gearing (and that's a lot, if we do say so!) is at your service. Why not a letter or a phone call today?



44 Years of Specializing in Small Gearing!

For More Information Write No. 556 on Inquiry Card—Page 34



**AT BCA** everything's new but the name

## **NEW "TORTURE CHAMBER" FOR RADIAL BEARINGS** duplicates military acceptance tests

This is a torture chamber for radial bearings. Here BCA ball bearings are run . . . hour after hour . . . under loads of 5000 pounds per bearing — matching military acceptance tests for radial bearings. This special BCA-built device is an important control and development tool. It provides essential data for BCA's ball bearing research program.

This tough performance test is an example of the greatly expanded research and testing facilities which BCA has developed for the benefit of bearings users. Reason: to provide the finest possible ball bearings to customers. Results: bearings which consistently exceed performance specifications on whatever kind of jobs they are designed for.

Among the extensive new facilities at the BCA laboratories is a Temperature-Humidity-Controlled Instrumentation

Room containing precision instruments, many of which have been specially designed and modified for bearing research. There are a number of unusual testing devices, too; in design, identical to equipment in customers' plants. On these, BCA bearings can be tested *under the exact operating conditions specified by the customer.*

BCA provides a complete line of ball bearing sizes and types for nearly every kind of industry. They're standard original equipment on automotive, machine tool, earth moving, and agricultural equipment, for example. And, you'll find BCA a dependable source not only for high-performance ball bearings but engineering assistance, should you need it. For more information, contact Bearings Company of America, Division of Federal-Mogul-Bower Bearings, Inc., Lancaster, Pa.



**BEARINGS COMPANY  
OF AMERICA**

ball  
bearings

DIVISION OF  
FEDERAL-MOGUL-BOWER  
BEARINGS, INC.

### **Idler Pulley Assemblies Cut Costs Two Ways**

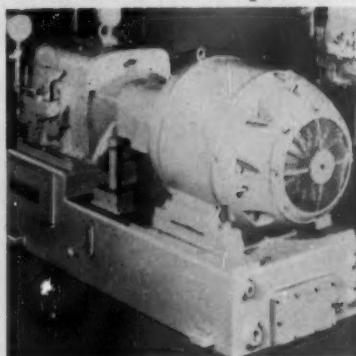
A farm implement manufacturer experienced rising costs in the installation of ball bearing pulleys on combines and other equipment. When he changed to New Departure Land-Riding Seal pulley assemblies the wide inner rings of the contained ball bearings eliminated conventional spacer inventories. In addition, pulleys are delivered fully assembled, thus cutting installation costs.

Write No. 728 on Inquiry Card—Page 34

### **Fluid Drive Solves Space Problem**

A large Midwestern paper manufacturer decided to install an extra processing section between two existing paper-making machines. A mechanical drive for the unit was considered but this would involve costly, major rebuilding of the entire machine. The problem was solved by using an Oilgear fluid drive, consisting of an Oilgear pump and motor, fluid power motor with right-

angle gear reducer, and a simple push button control station. Not only were space requirements met but drive maintained speed vari-



ations within rigid tolerances. No maintenance has been reported in over four years.

Write No. 729 on Inquiry Card—Page 34

### **Sleeve Bearings Reduce Cost by 40.6%**

The Portable Elevator Manufacturing Co. cut its bearing costs by 40.6% when it changed to sleeve bearings manufactured by Randall Graphite Bearings, Inc. The self-aligning, self-lubricating

bearings were chosen by the farm equipment manufacturer after lengthy field testing. The company reports that field maintenance of its equipment has been significantly reduced and that bearing wear after two years of heavy service is negligible.

Write No. 730 on Inquiry Card—Page 34

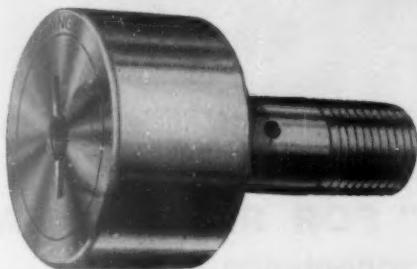
### **Laminate Sprockets Cut Excessive Conveyor Wear**



Sprockets made of a heavy-duty thermo-setting material—Westinghouse Micarta plastic laminate—have reduced excessive

(Please turn to page 408)

Type S—  
Standard Stud



### **ORANGE CAM FOLLOWERS**



Type H—Heavy Duty Stud

Heavy duty stud provides 20% greater bending resistance of the stem where severe operating conditions exist.

Sold by leading bearing distributors

Write for detailed literature

**ORANGE ROLLER  
BEARING CO., INC.**

554 Main St., Orange, N.J.

For More Information Write No. 558 on Inquiry Card—Page 34  
406

### **Maximum load capacity and shock resistance**

Heavy-sectioned outer race and small diameter rollers made of through-hardened, precision-ground, high quality steel. Rollers electronically gauged for uniformity of size. Studs of high grade steel, induction heat-treated for maximum hardness of the roller track, with core toughness to withstand high shock loads. Conventional lubrication passages provided for use with drive type fittings or may be sealed with plugs furnished. Choice of 22 standard sizes from  $\frac{1}{2}$ " to 4" O.D. Can be provided with seals. Chrome and cadmium plating, or black oxide finishes also supplied.

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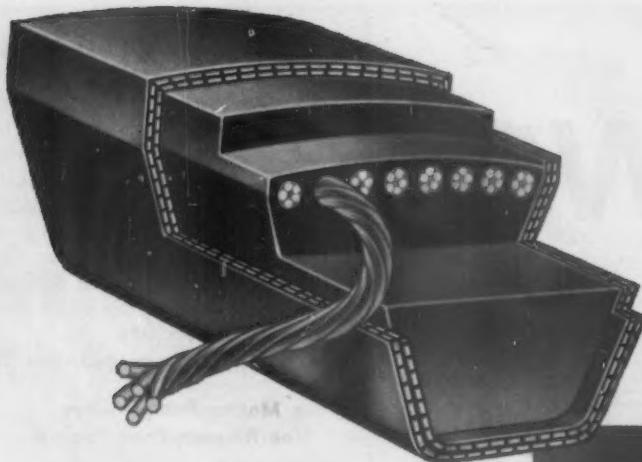
Name . . . . . Title . . . . .

Company . . . . . Principal Product . . . . .

Address . . . . . State . . . . .

City & Zone . . . . .

Send Purchasing to my home address:—

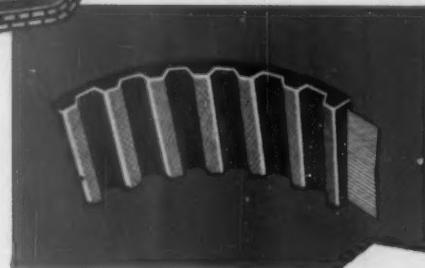


**Need High Capacity  
In Compact Space?**

**DA 358 V-BELTS.** This major design improvement in V-Belts brings you unprecedented compactness, high capacity and drive economy.

**Chain and Gear Benefits with  
No Metal-to-Metal Contact?**

**DA POSITIVE DRIVE BELTS.** Revolutionary tooth-grip principle; no stretch; no constant lubrication. Highly versatile.



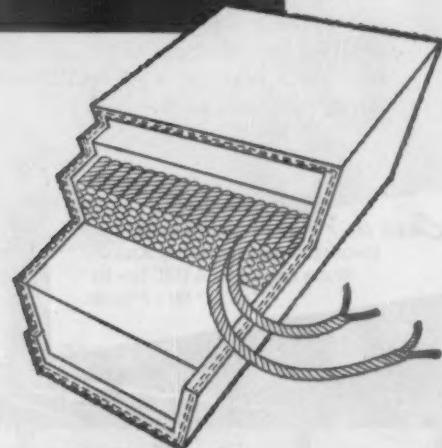
*Whatever your  
V-Belt needs,  
**DURKEE-  
ATWOOD**  
meets them*

What do you want in a V-Belt? You want consistent performance, long trouble-free life and full-rated power transmission. That means the belts must be made of the finest quality materials, with careful attention to engineering details, manufacturing processes and testing procedures. Durkee-Atwood V-Belts are made of the newest high tenacity synthetic fibres to assure length stability in storage. The exclusive Durkee-Atwood "Iso-Dynamic" Vertical Matching Machine eliminates the "sag error" that develops when V-Belts are matched on horizontal equipment. This assures equal power transmission from all belts on multiple drives . . . Look to Durkee-Atwood for quality, service and savings . . . the most complete line of industrial V-Belts.

Look for the



On Your V-Belts



**40% Extra Capacity  
in Regular V-Belts?**

**RED SHIELD MULTIPLE V-BELTS.** Increased capacity at no increased cost. Available in oil and heat resistant and static dissipating constructions.



**Top Performance in  
Variable Speed Drives?**

**VARIABLE SPEED BELTS.** For constant performance. Abrasion-resistant cover; crowned cross section maintains stability under extreme loads.

**DURKEE-ATWOOD V-BELTS**  
DURKEE-ATWOOD COMPANY

MINNEAPOLIS 13, MINNESOTA

For More Information Write No. 559 on Inquiry Card—Page 34

MAY 23, 1960

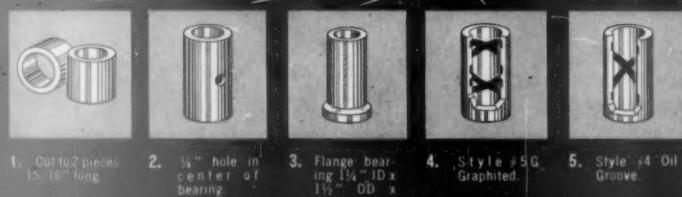
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# BUNTING BEARINGS

Bunting local machine shop service solves many critical problems

One, or small lots of specially designed bearings, not obtainable from stock, can now be procured immediately through your Bunting Distributor. Fully equipped machine shops in Bunting Branches are at your service for emergency and experimental needs. The wide range of sizes of Bunting stock cast bronze and sintered bronze bearings makes easy the alteration of a stock to a special bearing at low cost. Bunting Cast or Sintered Bronze and Bunting Bearing Aluminum Bars provide the material for special sizes and designs which cannot be made from stock bearings. Your local Bunting Distributor can arrange for such work.

*Case in Point* Showing some common alterations of Bunting Standard Stock Cast Bronze Bearing, No. G-1191. Size 1 $\frac{1}{4}$ " ID x 1 $\frac{1}{4}$ " OD x 2" length.



*Ask for Catalogs:*

No. 158—Complete listing of sizes of Bunting Cast Bronze and Sintered Bronze Bearings and Bars, and Bunting Bearing Aluminum Bars. Pocket size edition.

No. 258—Complete listing of Cast Bronze Electric Motor Bearings for all makes and sizes of electric motors.

No. 48—Technology of Bunting Bearing Aluminum. A technical treatise on the composition, machining and use of this new bearing metal. Ask your local Bunting Distributor.

**THE BUNTING Brass and Bronze Company**

TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

BEARINGS, BUSHINGS, BARS & SPECIAL PARTS OF CAST BRONZE, SINTERED METALS OR ALUMINUM ALLOYS

For More Information Write No. 560 on Inquiry Card—Page 34

(Continued from page 408)

wear in the conveyor system at the E. H. Koester Bakery, Baltimore. Formerly steel sprockets were used. It wasn't possible to lubricate because the foodstuffs could not be contaminated by lubricating oils. The plastic laminate sprockets need no lubrication and their uniformity assures smooth, even wear. Sprockets last several years, compared to the 60-90 day life of steel sprockets.

Write No. 731 on Inquiry Card—Page 34

## Triplex Pump Makes Maintenance-Free Record



A John Bean triplex pump provides hydrostatic pressure to operate a 40,000 lb. capacity hydraulic elevator at Oklahoma City's Black, Sivalls and Bryson steel plant. Pump permits use of water as hydraulic medium, with resulting lower costs and elimination of odors and fire hazards. Suitable for many applications, Model 450 pump has been maintenance-free during a year's intermittent operation.

Write No. 732 on Inquiry Card—Page 34



"I called you in here about your work, Biggs. When are you going to do some?"

PURCHASING



## 2 worn-out spindles received early Sunday...2 rebuilt spindles in service Monday morning, 600 miles away!

The customer was in Greenville, South Carolina working on a time contract with stiff penalties for failing to meet the deadline. The spindles on two of their most important machine tools failed almost simultaneously and there were no spares available.

Our subsidiary, Dixie Bearings, Inc., was called late Saturday; our Spindle Repair Department in Cleveland alerted and, with the cooperation of Eastern Airlines, the spindles

were in our shop early Sunday. By working all day Sunday, the spindles were back in Greenville and in operation on Monday morning!

This is only one of the many bearing services we provide. For fast help in solving any problem involving bearings—for quick delivery of any nationally known make of bearing—call the branch nearest you, day or night!

**Providing bearing service  
in the North** **►**

### BEARINGS, INC.

**OHIO:** Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Painesville • Toledo • Youngstown  
**Zanesville** • **INDIANA:** Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York  
**WEST VIRGINIA:** Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden • Newark  
**NEW YORK:** Balmer Corp., Buffalo • Niagara Falls • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

**and**  
**in the South** **►**

### DIXIE BEARINGS, INC.

**FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans  
**N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville  
**VIRGINIA:** Norfolk • Richmond

For More Information Write No. 561 on Inquiry Card—Page 34



## DODGE PRODUCTS

you  
should  
know



### FLEXIDYNE

#### THE DRY FLUID DRIVE

New soft starts—overload protection



### TAPER-LOCK CHAIN COUPLINGS

No reborning—no waiting!



### SC, SCM BALL BEARING PILLOW BLOCKS

Quality, for normal and medium duty!

#### Write for Bulletins!

- ✓ Flexidyne Drives & Couplings.
- ✓ Chain Couplings and Sprockets.
- ✓ Bearings—Ball and Roller.

DODGE MANUFACTURING CORPORATION  
1300 Union Street • Mishawaka, Indiana

**DODGE**

of Mishawaka, Ind.

For More Information Write No. 562  
on Inquiry Card—Page 34

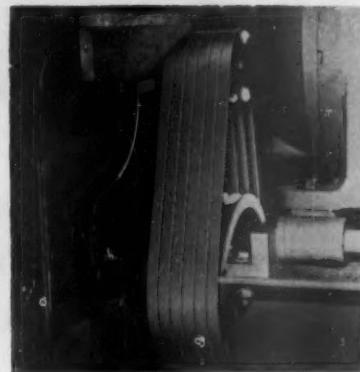
### Motor Strain Eased by New Dry Fluid Drive



A dry fluid drive installed on a ball mill at the Star Porcelain Company plant, Trenton, N.J. overcame motor strain caused by heavy inertia starting load. Before installation of the Flexidyne drive, made by Dodge Manufacturing Corporation, it was necessary to rock the mill to get it started. The drive also incorporates taper-lock sheaves and a torque-arm speed reducer.

Write No. 733 on Inquiry Card—Page 34

### New Type V-Belt Cuts Cost 38%



In June, 1959, the Eclipse Lumber Co. of Everett, Washington asked Gates Rubber distributor, Everett Transmission and Rubber Co. to quote on v-belt drives. Everett quoted both with conventional belts and with Gates Super HC V-Belts. The difference was amazing. The Gates belts cost 38% less. In addition, they weighed 40% less; 40% fewer belts were needed; and they occupied 57% less space. The Gates belts are still running perfectly even though they have been in operation 16 hours a day ever since.

Write No. 734 on Inquiry Card—Page 34

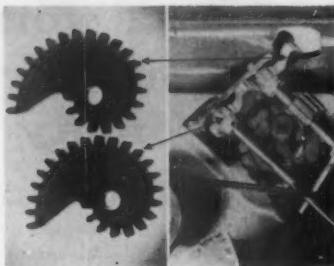
### Machine Synchronizes Feeding and Crimping



To automate a parts feeding operation, Stewart Warner Corporation, Chicago, Ill. uses a Proximity Control System—an electronic device to synchronize feeding with crimping. This system allows production to be maintained without interruption, while the operator devotes her entire attention to monitoring. Previously, she had to switch the feeder on and off, which often caused parts to spill out of the feeder with a loss of fittings and costly production delays.

Write No. 735 on Inquiry Card—Page 34

### Zinc Castings Cut Costs Of Copying Machines

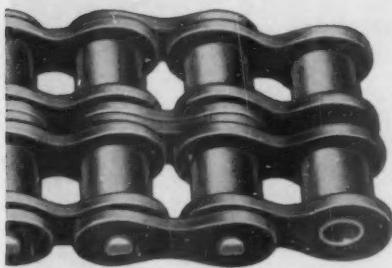


Zinc die casting has helped solve an intricate gearing problem at low production cost for Minnesota Mining & Manufacturing Co. in its fabrication of Thermofax copying machines. Zinc castings which require no machining have replaced investment castings on a pair of identical mating, variable pitch gears in the machines. The cost of the zinc castings is reportedly fractional in comparison.

Write No. 736 on Inquiry Card—Page 34



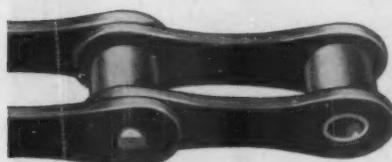
SINGLE STRAND



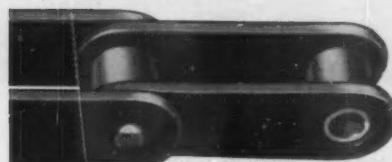
DOUBLE STRAND



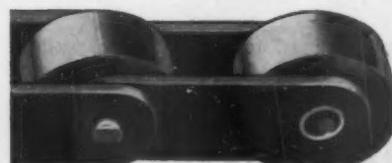
SINGLE STRAND, HEAVY SERIES



DOUBLE PITCH TRANSMISSION



DOUBLE PITCH CONVEYOR

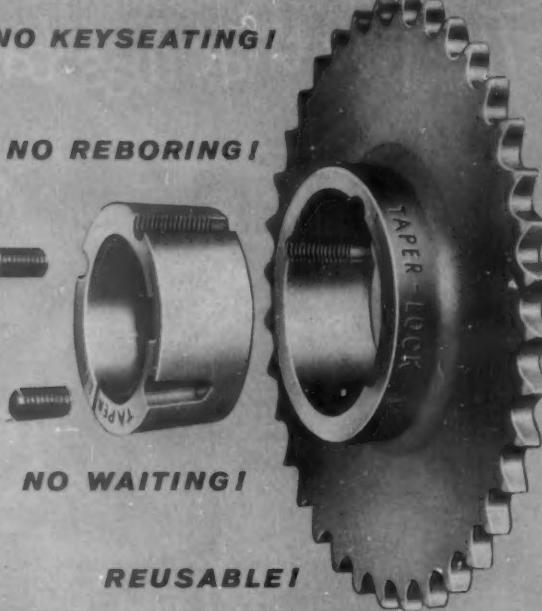


DOUBLE PITCH CONVEYOR, LARGE ROLLERS

**CALL THE TRANSMISSIONEER**—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the white pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

**NO KEYSEATING!**

**NO REBORING!**



**NO WAITING!**

**REUSABLE!**

## TAPER-LOCK SPROCKETS DODGE ROLLER CHAIN

**DODGE** Quality Roller Chain, teamed with Dodge Taper-Lock Sprockets, results in chain drives and chain conveyors that have the precision, efficiency and stamina necessary for the real economy of *long life*.

Moreover, Taper-Lock's reusable bushing makes a difference in overall cost. The ease of Taper-Lock mounting, the elimination of reboring, keyseating, and wasted time, add to the saving. Precision machining and true articulation lengthen the life of *both* sprocket and chain.

The Dodge line of chain, including standard attachments, is extensive. It meets a high percentage of all chain requirements.

In the Double Pitch series (both Transmission and Conveyor) the sizes which require special spacing for perfect tooth action are offered from stock in special double pitch design — to double the life of the chain and the sprocket!

Ask your local Dodge Distributor. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 1300 Union St., Mishawaka, Ind.



**DODGE**  
of Mishawaka, Ind.

For More Information Write No. 563 on Inquiry Card—Page 34

# The box that was taught to dance



**MILLS:**  
Macon, Georgia  
Rome, Georgia

**BOX PLANTS**

Indianapolis, Indiana  
Middletown, Ohio  
Winchester, Virginia  
Milwaukee, Wisconsin  
Evansville, Indiana  
Detroit, Michigan  
Macon, Georgia  
Erie, Pennsylvania  
Ashtabula, Ohio  
Orlando, Florida  
Rome, Georgia  
Biglerville, Pennsylvania  
Louisville, Kentucky  
Dallas, Texas  
Chicago, Illinois  
Philadelphia, Pennsylvania  
Baltimore, Maryland  
Omaha, Nebraska

Everyone knows that a truck or freight car does more rockin' and rollin' than a 'teen-ager.

So at Inland, we test our boxes on a vibrator. It makes a box dance as though it were riding in a box car with eight flat wheels.

Another merciless device called the Conbur tester sends boxes careening down inclines to slam into a wall. Puncture tests determine how to cope with handlers who can't read "Use No Hooks" signs.

A compression tester can put up to 30,000 pounds of pressure on your box. That's like putting a crated piano on a carton of eggs.

The story behind the dancing box assures "happy landings" for products packaged in Inland containers because Inland engineering and testing leaves no room for guess work.



**INLAND CONTAINER CORPORATION**

Corrugated Fiber Containers  
General Offices, Indianapolis, Indiana

*Partners in Progress with American Industry*

For More Information Write No. 564 on Inquiry Card—Page 34

PURCHASING

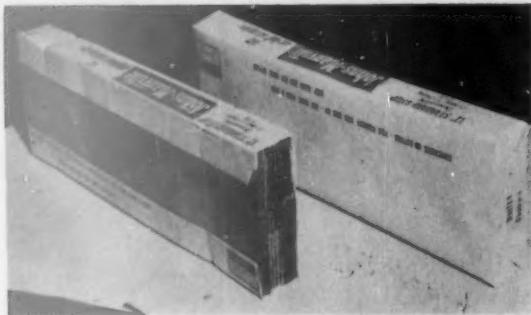


V

## Packaging and Shipping

A

## Packaging and Shipping



### Mechanized Wrapping Increases Production 40%

Johns-Manville, at its Waukegan, Ill., plant, has increased the capacity of its shingle-wrapping line 40% by installing a new custom-built wrapping machine and automatic feeder for synchronized delivery of wrapping paper. The wrapping machine was designed and built by Reichel & Drews, Inc., the feeder by The Dexter Co. Additional advantages gained over wire-tied bundles: bundles are now completely wrapped where formerly one side and ends were exposed; wire damage to shingles is eliminated.

WRITE NO. 565 ON INQUIRY CARD—PAGE 34



### Cut Handling Costs 90% With Unitized Lumber Shipments

A major producer of pre-cut houses, Swift Homes, Pittsburgh, switched from loose shipments of lumber to receiving unitized freight car loads and effected a 90% cost saving. In both methods two lift trucks were used. It used to take 32 man-hours to unload the loose lumber while now the steel banded loads take two lift truck operators only 14 minutes to unload. The Yale lift trucks can be used elsewhere in the plant since they're not tied up all day unloading the cars.

WRITE NO. 566 ON INQUIRY CARD—PAGE 34



### Wirebound Boxes Speed Unpacking, Simplify Re-shipment

The Jasper Blackburn Co. of St. Louis makes it easy and economical for its distributors to re-ship its pole line hardware and line equipment by packing from six to ten cartons in wirebound boxes closed with wire loop fasteners. Only 1.2 man-minutes is needed to pack such a box. Since no nails are used, distributors can open wireloop fasteners easily and after unpacking dismantle the boxes and store them flat for re-use to ship products to customers.

WRITE NO. 567 ON INQUIRY CARD—PAGE 34

# from truck to train



## with Eager-Beaver responsibility!

Railway Express never limits you to one kind of transportation. We provide trucks to ship across town. Trucks and trains and planes to ship across the *nation*. Ships and planes to ship across the *world*. Count on Railway Express Eager-Beaver service for the kind of transportation that best suits your particular needs.

That's not the only advantage Railway Express offers you. For example:

- Nationwide coverage to some 23,000 communities in the U.S.
- International service to and from almost anywhere in the world
- Unified, one-carrier responsibility all the way
- Door-to-door delivery at no extra charge (within authorized limits)
- Lower rates on certain shipment aggregations of 300 lbs. or more
- Special low rates on many other commodities

Railway Express gives you service no other organization can match. And, with our long-range improvement plans well underway, we're able—and eager—to give your shipments the thorough service you want. Next time you ship, call Railway Express—and see!

For More Information Write No. 568 on Inquiry Card—Page 34

MAY 23, 1960

415





## Nobody laughs when he sits down to play

There's a good reason. Ernie Wright plays for pretty high stakes. In terms of packaging savings to users of corrugated boxes they frequently run to thousands of dollars. Tens of thousands in some cases.

It doesn't matter what the product, Ernie can usually find a way to box it better. His record as an economy expert is largely built on imaginative use of inner packing. A corrugated box specialist for 30 years, Ernie has probably created more cost-cutting interior safeguards than any man in the business.

One Union-Camp box he developed for a textile company featured a unique die-cut unit that provided positive protection by "floating" the individual spools of yarn. Another box design for a business machine manufacturer made use of a corrugated inner "saddle" which firmly anchored the box's contents—yet contributed to an overall packaging cost reduction of 25 per cent!

A third box, constructed in cooperation with an instrument maker, weighed ten pounds less than the previous container . . . and measured nine inches shorter. Nevertheless the new design gave increased pro-

tection to the delicate instruments at a significantly reduced overall cost. While these are just a few of the types of products which have benefited from a Union-Camp corrugated package analysis, they're typical of the kind of packaging efficiency we can often help you achieve.

Perhaps Ernie Wright can come up with a new packaging idea for your product. Perhaps several. It might be an unusual anchoring device. A more effective type of cushion against impact or vibration. Or, possibly a simple twist that would involve nothing more than a minor modification of the box design you are now using. In any case, it costs nothing to find out. While you're about it why not look into Union-Camp's complete corrugated box service.

You'll be surprised at the savings it can offer.



**UNION-CAMP®**  
CORRUGATED BOXES

Union Bag-Camp Paper Corporation • 233 Broadway N.Y. 7, N.Y.

Plants: Savannah, Georgia • Trenton, New Jersey • Chicago, Illinois • Lake-

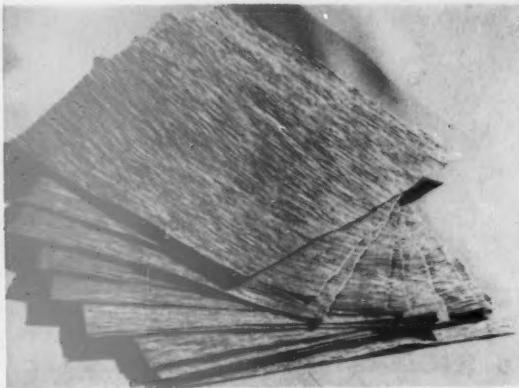
land, Florida • Spartanburg, South Carolina • Jamestown, North Carolina

Subsidiaries: Allied Container Corporation, Dedham, Massachusetts

The Eastern Box Company, Baltimore, Maryland.

For More Information Write No. 569 on Inquiry Card—Page 34

## Packaging and Shipping



### Interleaves Reduce Size Of Package And Cut Packing Time

Aluminum discs with a sharp prong which would scratch other discs are being packaged with flexible cushion interleaves. The new method saves packaging time and package sizes. Under the old system two materials were used making process expensive and time consuming. The same number of discs are now packaged in a carton 1/3 smaller than previously. The material is supplied by Straubel Paper Company.

WRITE NO. 570 ON INQUIRY CARD—PAGE 34



### Labor And Production Costs Cut With Large Specialty Bag

The installation of a Bemis Bro. packaging machine and adoption of kraft paper specialty bags for its laminated plastic sheets enabled Formica Corporation to substantially reduce its labor force and production costs. The near-automatic system is the result of a new sheet loader which consists of a horizontal stainless steel bed mounted on a steel frame at table height.

WRITE NO. 571 ON INQUIRY CARD—PAGE 34



### 60% Saving In Packaging Achieved By Parts Manufacturer

Packaging costs have been reduced 60% by Stewart-Warner Corp. through the use of Kimbley-Clark Corporation's creped cellulose wadding. Small automotive and specialty hardware items get shipping protection of wrapped package without actually being wrapped. Items are packed in seven layers, 25 to 30 to the layer, with pieces of wadding between each layer.

WRITE NO. 572 ON INQUIRY CARD—PAGE 34

For More Information about ad on facing page Write No. 573 on Inquiry Card—pg. 34→

PURCHASING



**DOWN ON THE FARM** or in the garage there's a new greaseless way to handle grease: A Sefton Fibre tube, clean, prepacked and sealed, clicks into a grease gun, ready for instant use. No more sloppy bulk pails, no more dirt or grit in unused grease, no more leaks. Economical? Yes. But more important, a practical demonstration of CCA's informed ingenuity meeting the needs of all kinds of people through packaging. To pack it—move it—sell it is the business of CCA packaging.

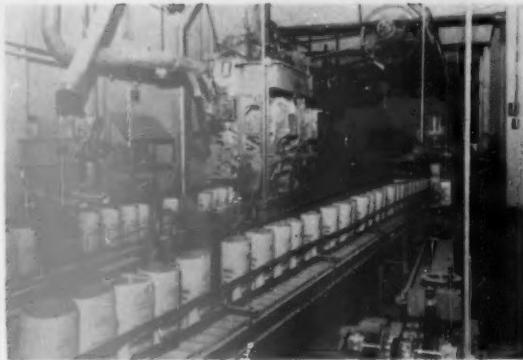
**CONTAINER CORPORATION OF AMERICA**

Chicago 3... and all key marketing areas

**CCA**

Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products, Point-of-Purchase Displays, Paperboard

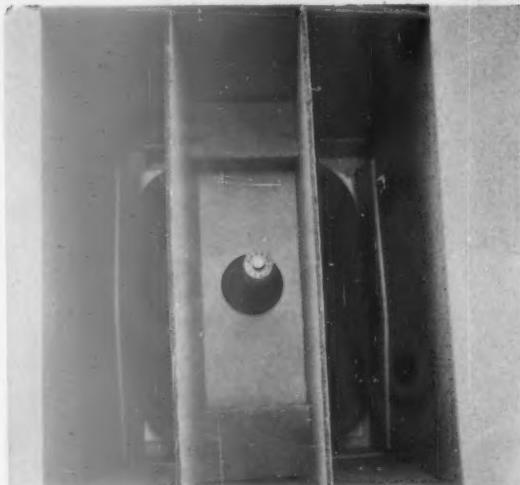
## Packaging and Shipping



### Production Increased And Costs Cut With New Packaging Unit

A push-button operation is in effect in the bag packing department of a southern milling company because of the installation of a Bemis feeding and filling machine and a Trim-Weigh scale. The new equipment has made possible increased packaging speeds. The bags are automatically opened and fed to the filling spout from a magazine supply. Two bags are filled simultaneously; they then move to a duplex scale which weighs each bag independently.

WRITE NO. 574 ON INQUIRY CARD—PAGE 34



### Hold Down Pad Saves \$10,000 in Packaging Costs

Because consumers know that a television picture tube is a delicate device, they are wary of buying a tube in a box showing wear. Vactron Corp. has solved the high cost of repacking with a new "I" pad that keeps tube in place and gives container added strength. Pad, developed by Hoerner Boxes, Keokuk, Iowa, also cuts down material cost because it allows use of single instead of double wall corrugated.

WRITE NO. 575 ON INQUIRY CARD—PAGE 34



### New Container Cuts Packaging Manpower From Four to Two

Auditorium seats were formerly shipped by one manufacturer in open corrugated boxes with wood runners. A change to a new container designed by Gaylord Container Division of Crown Zellerbach Corp. brought about a reduction of the number of men in the packaging department from four to two. With the new container, all sizes of standard inclines can be packed in one size container.

WRITE NO. 576 ON INQUIRY CARD—PAGE 34

*Planned Packaging moves merchandise*

## *Here's an artist who sells your merchandise*

This man and many others like him on Packaging Corporation of America's technical staff devote themselves to *selling your products*. Cooperating with product development and production engineers engaged in constant improvements of packaging materials and methods of all types, they form a *creative team*. Under their skilled hands the container or carton is transformed into a colorful, appealing creation that works for you in transit, promotes its contents from shelves and counters, invites buyers to reach for it. Experimenting with color arrangements, with special inks and a variety of printing processes . . . theirs is a continuing quest for all the ways in which artful package exteriors can sell harder.

Bringing this ingenuity to the design of your packaging is but one of countless ways in which Packaging Corporation of America's concept of Planned Packaging, implemented through integrated national facilities, produces better packaging . . . more sales. Whether your requirements are large or small, regional or national, we welcome the opportunity to help you.



## *Packaging Corporation of America*

1632 CHICAGO AVENUE, EVANSTON, ILLINOIS

Cartons • Containers • Displays • Egg Packaging Products • Molded Pulp Products • Paperboards

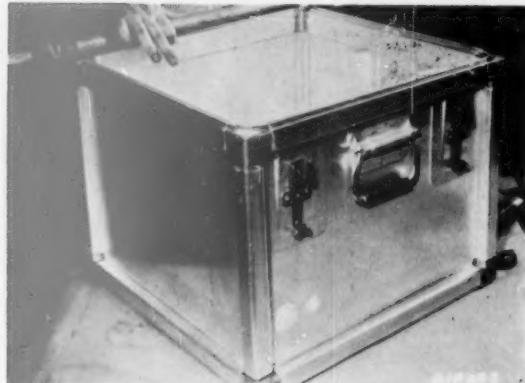
For More Information Write No. 405 on Inquiry Card—Page 34

MAY 23, 1960

421

**V  
VALUE ANALYSIS  
A**

## Packaging and Shipping



### Adhesive Bonded Metal Containers Reduce Costs 25%

The use of adhesive bonding to assemble metal, water-tight, light-weight shipping containers has reduced design and production costs by 25% at Zero Manufacturing Co. in California. The adhesive selected is a one-part high strength adhesive with an epoxy resin base. A wide variety of sizes in containers was required. The erector set principle was used in which the entire container is assembled by adhesive bonding. A product of Minnesota Mining & Manufacturing Co.

Write No. 406 on Inquiry Card—Page 34



### Reduction of \$24,000 In One Shipment From Chicago to Puerto Rico

Shipping equipment for 72 complete bowling alleys from the Chicago plant of AMF to Puerto Rico by trailership resulted in a saving of \$24,000 in shipping costs. The saving was achieved through the use of Interstate System and Pan-Atlantic Steamship Company's Sea-Land service. Interstate tractors moved to Port Newark, N.J. where self-contained cranes lifted the entire trailer from its chassis and loaded it aboard ship. The ships can carry 226 trailers in the holds.

Write No. 407 on Inquiry Card—Page 34



### New Fibre Package Permits Automatic Handling

Good packaging of precision sub-miniature electronic components is essential. To solve the problem of automatic packaging and yet provide protection in transit one electronic manufacturer made use of .015 inch thick vulcanized fibre. In it, the diodes are separated by notches; formed ribs protect them from being crushed or broken. The whole package is automatically packed by a specially-designed machine. National Vulcanized Fibre Co. supplied the packaging material.

Write No. 408 on Inquiry Card—Page 34

For More Information about ad on facing  
page Write No. 409 on Inquiry Card—pg. 34—  
PURCHASING



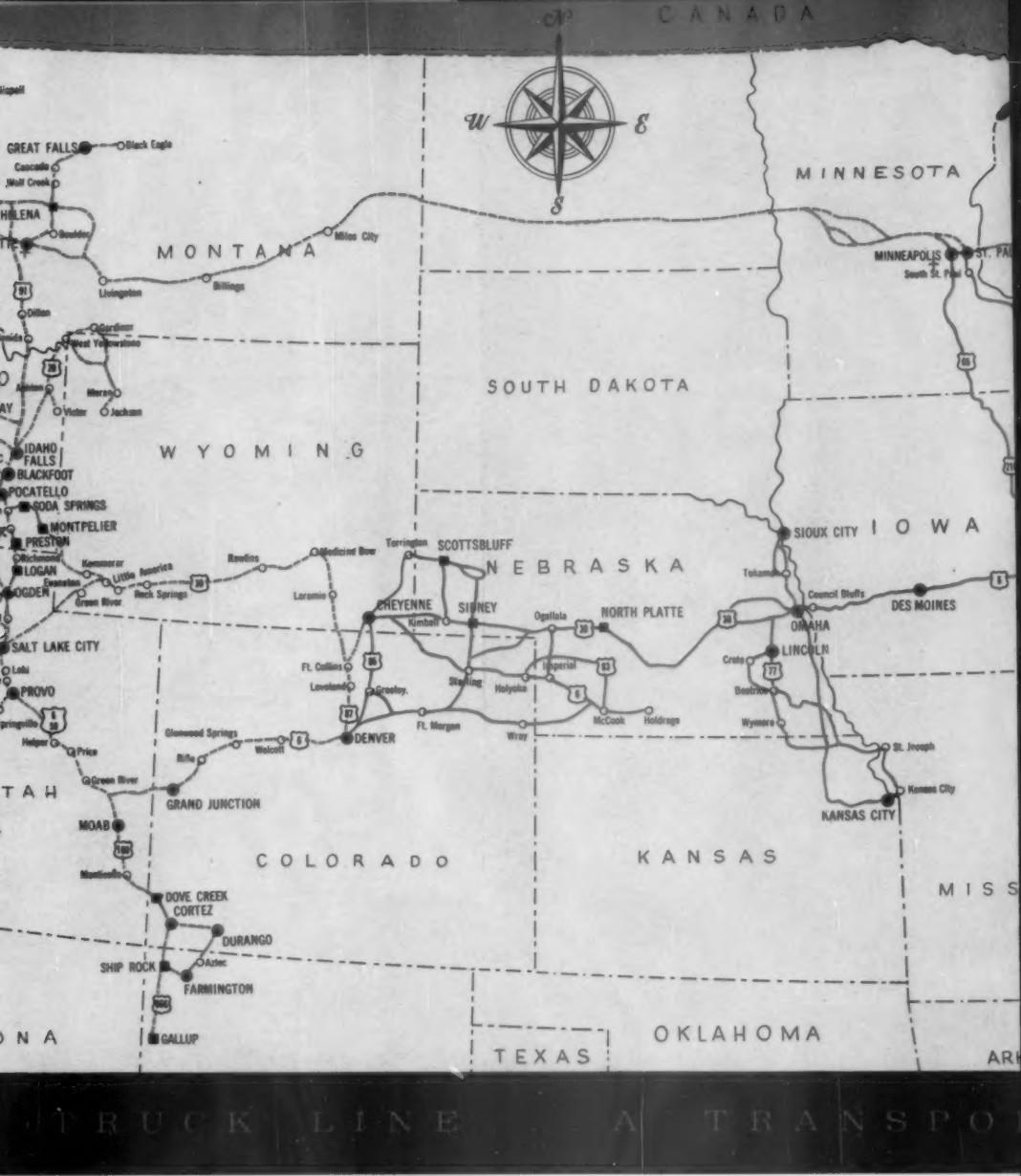
"ON THE MOVE!"



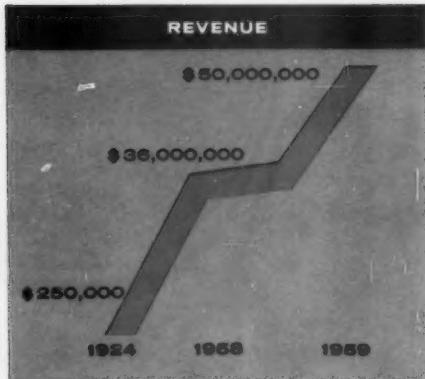
MORE THAN A

## AMERICA'S FASTEST GROWING MO-

PATTERN FOR GROWTH	
1924	TERMINALS — 8 AUTHORITY — 4 STATES VEHICLES — 148 ROUTE MILES — 1,975 EMPLOYEES — 108
1959	TERMINALS — 78 AUTHORITY — 24 STATES VEHICLES — 3,350 ROUTE MILES — 23,013 EMPLOYEES — 4,200



## MOTOR FREIGHT SYSTEM



## EXCEPTIONAL SERVICE

**Direct service to important markets.** We provide reliable service to nearly every crossroad on the map. It's possible only with a direct, single-line carrier. Faster, too.

**LTL Service.** Direct, single-line, time-tabled LTL Service, the fastest, most dependable in the country.

**Coast-to-coast.** Guaranteed thru rates to or from West Coast points as named in Rocky Mountain tariffs via Garrett Freightlines. Rates, schedules, times, etc., on request.

**Distribution tariffs.** Allow shippers to cover multiple markets at less cost than applicable LTL rates. Saves you time and money. Ask us!



## A TRANSPORTATION SYSTEM

### EXCEPTIONAL SERVICE

**Direct service to important markets.** We provide reliable service to nearly every crossroad on the map. It's possible only with a direct, single-line carrier. Faster, too.

**LTL Service.** Direct, single-line, time-tabled LTL Service, the fastest, most dependable in the country.

**Coast-to-coast.** Guaranteed thru rates to or from West Coast points as named in Rocky Mountain tariffs via Garrett Freightlines. Rates, schedules, times, etc., on request.

**Distribution tariffs.** Allow shippers to cover multiple markets at less cost than applicable LTL rates. Saves you time and money. Ask us!

**Time schedule merchandise runs.** Over 260 timed departures and arrivals. Shipments leave on time; arrive on time. Fast, dependable. No delays waiting for loads to be made up.

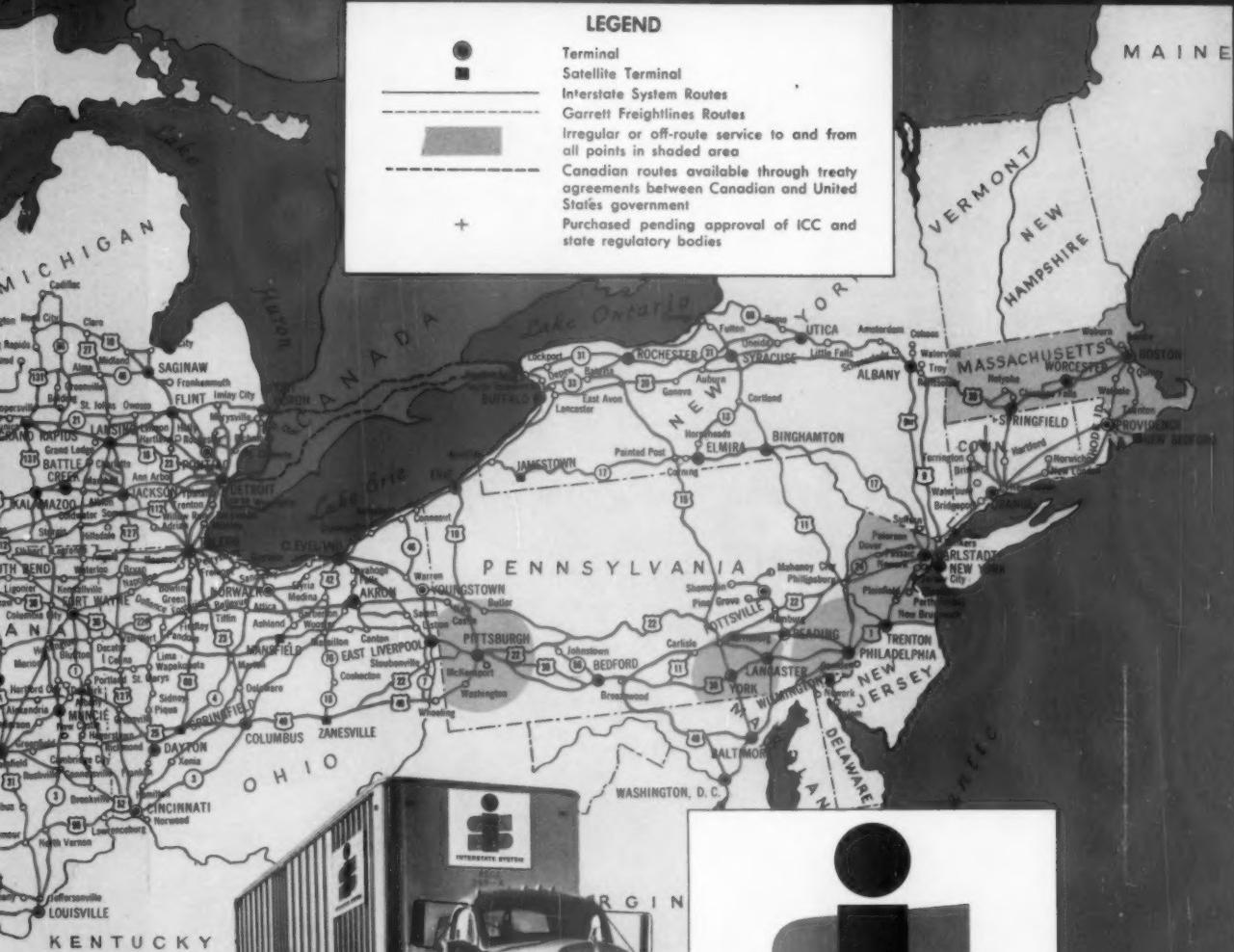
**Import — export and Canadian service.** Experience routing foreign, domestic freight by sea. Canadian offices: Toronto, Montreal.

**Direct service to/from Puerto Rico.** With Atlantic Sea-Land Service. Substantial savings no special preparations. From anywhere in system.

**Claim-free shipments.** Our record is only one for every 189 shipments — and we settle 8 out in 30 days.

## LEGEND

- Terminal
- Satellite Terminal
- Interstate System Routes
- Garrett Freightlines Routes
- Irregular or off-route service to and from all points in shaded area
- Canadian routes available through treaty agreements between Canadian and United States government
- Purchased pending approval of ICC and state regulatory bodies



## EQUIPMENT AND FACILITIES



**NEW TERMINALS** We maintain modern terminals in 78 key cities in 24 states. Each is equipped with the newest in handling equipment. This tow-line system in our Buffalo, New York, terminal typifies materials-handling efficiency.



**NEW TRACTORS AND TRAILERS** We've just added 150 more of these 40-foot vans to our fleet to provide extra capacity for your TL and LTL shipments. And our entire system is equipped with new, rugged heavy-duty diesel power units.



**FULL-TIME TRANSPORTATION CONTROL** Private long-line telephone circuits maintain continual 24-hour contact with all terminals in the system, enabling our dispatchers to pin-point shipments in minutes, wherever they may be.

60 daily  
leave on  
no delays,

• Broad  
by land,

With Pan-  
avings —  
in our

one claim  
out of 10



## INTERSTATE SYSTEM'S TRANSPORTATION SPECIALIST...

His function is to provide you with the swift, safe, dependable transportation you want — on both inbound and outbound freight — and to save you money doing it. Put him to work for you. Just call the number of the terminal that's closest to you.

**AKRON 7, OHIO**  
165 Case Ave.  
Republic 3-6247

**ALBANY 5, NEW YORK**  
Albany-Shaker Road (P.O. Box 5027)  
State 5-6664

**BALTIMORE 30; MARYLAND**  
1707 Wicomico St.  
Vernon 7-8888

**BATTLE CREEK, MICHIGAN**  
54 Avenue C  
Woodward 2-5494

**BEDFORD, PENNSYLVANIA**  
Highway 220 N. (P.O. Box 353)  
Bedford 513

**BENTON HARBOR, MICHIGAN**  
M-139 and Nickerson Rd.  
Walnut 5-2127

**BETTENDORF, IOWA**  
3708 Elm St.  
5-4717

**BINGHAMTON, NEW YORK**  
67 Elm St.  
Raymond 2-7269

**BOSTON, MASSACHUSETTS**  
91 Mountain Road  
Highlands 2-2100  
(BURLINGTON)  
Browning 2-1700

**BUFFALO 20, NEW YORK**  
534 Hopkins St.  
Fairview 9456

**CARLSTADT, NEW JERSEY**  
250 Paterson Plank Road  
Webster 3-4700  
(See New York Sales Office)

Wisconsin 7-5500  
Humboldt 2-1737

**CHEYENNE, WYOMING**  
2311 Reed St.  
Cheyenne 4-4621

**CHICAGO, ILLINOIS**  
5401 W. 37th St., Cicero, Illinois  
Bishop 2-3700

**CINCINNATI 37, OHIO**  
7623 Production Drive  
Poplar 1-6200

**CLEVELAND 35, OHIO**  
13775 Brookpark Road  
Clearwater 2-4350

**COLUMBUS 4, OHIO**  
3616 Fisher Road,  
Broadway 6-5221

**DAYTON 4, OHIO**  
1509 Stanley Ave.  
Baldwin 2-1293

**DENVER, COLORADO**  
5150 Monroe  
Tabor 5-3347

**DES MOINES, IOWA**  
523 S.E. 20th St.  
Amherst 6-5187

**DETROIT 34, MICHIGAN**  
13400 Girardin Ave.  
Forest 6-5134

**EAST LIVERPOOL, OHIO**  
West Fourth Street Extension  
Fulton 6-5401

**ELMIRA, NEW YORK**  
951 Grand Central Ave.  
Regent 4-6177

**ERIE 2, PENNSYLVANIA**  
124 East 19th St.  
Glendale 4-0614

**EVANSVILLE 11, INDIANA**  
321 North Keth  
Harrison 5-7159

**FLINT 7, MICHIGAN**  
4025 N. Dort Highway  
Cedar 5-8533

**FORT WAYNE 7, INDIANA**  
1130 W. Main St.  
Anthony 5-3666

**GRAND RAPIDS 2, MICHIGAN**  
235 Grandville Ave., S.W.  
Glendale 9-4201

**GREENCASTLE, INDIANA**  
Martinsville Ave. and Zinc Mill Rd.  
Oliver 3-5143

**INDIANAPOLIS 21, INDIANA**  
1560 W. Raymond St.  
Menrose 2-5461

**JACKSON, MICHIGAN**  
209 W. Monroe St.  
State 9-8174

**KALAMAZOO 19, MICHIGAN**  
1421 Healy St.  
Fireside 3-1581

**KANSAS CITY, KANSAS**  
Ohio and Market Sts.  
Drexel 1-6513

**KOKOMO, INDIANA**  
110 E. Morgan St.  
Gladstone 7-5361

**LANCASTER, PENNSYLVANIA**  
Manheimer Pike, Box 539  
Express 4-2683

**LANSING 5, MICHIGAN**  
1010 Ballard St.  
Vanhoen 5-9406

**LINCOLN, NEBRASKA**  
201 "O" St.  
Hemlock 5-3222

**LOUISVILLE 1, KENTUCKY**  
3435 S. 7th Street Road  
Melrose 5-2521

**MILWAUKEE 14, WISCONSIN**  
4525 W. Burnham  
Evergreen 4-3600

**MINNEAPOLIS (ST. PAUL), MINNESOTA**  
2193 Kasota St. (St. Paul)  
Midway 5-9271

**MUNCIE, INDIANA**  
2901 S. Charkay St.  
Atlas 2-2269  
(ANDERSON)  
3-6204

**MUSKEGON, MICHIGAN**  
1940 Commerce St.  
Parkway 2-6606-07

**NEW YORK 18, NEW YORK (Sales Office)**  
(See Carlstadt Terminal)  
625 8th Ave.  
Pennsylvania 6-0520

**NORWALK, OHIO**  
Route 20 E. (P.O. Box 380)  
4-531

**OMAHA, NEBRASKA**  
2615 N. 11th St.  
Atlantic 0-0484

**ORANGE, CONNECTICUT**  
Carlson Road  
Sycamore 5-9784  
(BRIDGEPORT)  
Edison 4-4024  
(HARTFORD)  
Jackson 5-7156

**PEDRIA, ILLINOIS**  
2006 Griswold St.  
7-7755

**PHILADELPHIA 54, PENNSYLVANIA**  
7931 E. Tinga St.  
Garfield 5-3300

**PITTSBURGH 1, PENNSYLVANIA**  
153 50th Street  
Mayflower 1-3192

**PONTIAC 20, MICHIGAN**  
117 Brush St.  
Federal 4-3561

**PORT HURON, MICHIGAN**  
1126 Lapeer Ave.  
Yukon 5-9571

**POTTSVILLE, PENNSYLVANIA**  
250 Peacock St.  
Market 2-6983

**PROVIDENCE, RHODE ISLAND**  
50 King St. (Johnston, Rhode Island)  
Temple 1-6966

**READING, PENNSYLVANIA**  
732 Tulpehocken St.  
Franklin 4-2297

**ROCHESTER 6, NEW YORK**  
979 Mt. Read Blvd.  
Glenwood 3-0723

**SAGINAW, MICHIGAN**  
2750 Bay Road  
Swift 2-9862

**SIOUX CITY, IOWA**  
510 Third St.  
8-1810

**ST. LOUIS 6, MISSOURI**  
49 W. East Grand Ave.  
Central 1-6050

**ST. PAUL 14, (MINNEAPOLIS) MINNESOTA**  
2193 Kasota St. (St. Paul)  
Midway 5-9271

**SOUTH BEND 21, INDIANA**  
2102 Davis Dr.  
Atlantic 7-1511  
(ELKHART)  
2-3184

**SPRINGFIELD, MASSACHUSETTS**  
657 Meadow, Chicopee, Massachusetts  
Lyceum 4-6637

**SYRACUSE 1, NEW YORK**  
15 Dippold St., Mattydale, New York  
Glenview 4-2441

**TERRE HAUTE, INDIANA**  
25 Eagle St.  
Crawford 9-6559

**TOLEDO, OHIO**  
215 City Park at Swan Creek  
Cherry 1-1161

**TRENTON, NEW JERSEY**  
243 Stokes Ave.  
Owen 5-7683

**UTICA, NEW YORK**  
Truck Route 5A (P.O. Box 31, Yorkville, N.Y.)  
Redwood 6-3041

**WASHINGTON, D. C.**  
3005 Kenilworth Ave.  
Bladensburg, Maryland  
Union 4-8010

**WATSEKA, ILLINOIS**  
610 East Walnut Street  
Idlewood 2-2918

**WORCESTER 4, MASSACHUSETTS**  
13 S.W. Cut Off  
Pleasant 7-5661

**YORK, PENNSYLVANIA**  
501 S. State St.  
3-3851

**YOUNGSTOWN, OHIO**  
58 Hubbard Road  
Riverside 6-8461  
(WARREN)  
Enterprise 8461  
(NILES)  
Enterprise 8461

### SATELLITE TERMINALS

**JAMESTOWN, NEW YORK**  
Allen Street Extension  
5-1809

**MANSFIELD, OHIO**  
328 North Diamond  
Lafayette 2-7554

**NEW BEDFORD, MASSACHUSETTS**  
281 North Water  
Wymbo 7-3871

**NORTH PLATTE, NEBRASKA**  
703 E. 7th St.  
Lenox 2-5142

**SCOTTSBURG, NEBRASKA**  
P.O. Box 748  
1532

**SIDNEY, NEBRASKA**  
P.O. Box 211  
2220

**SPRINGFIELD, OHIO**  
Rear, 273 Selma Road  
Fairfax 2-4112

**WILMINGTON, DELAWARE**  
305 Hazeldell Ave.  
Olympia 2-1145

**ZANESVILLE, OHIO**  
1502 Woodlawn Ave.  
Gladstone 2-5405

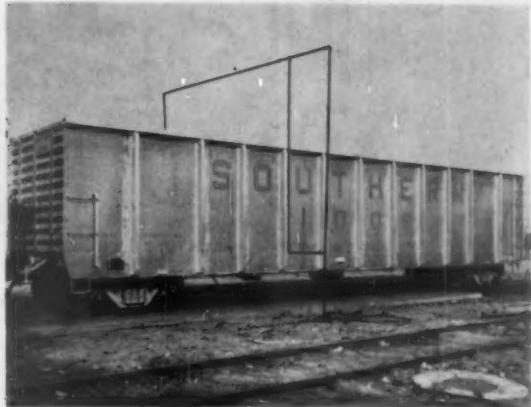
## Packaging and Shipping

V  
VALUE ANALYSIS  
A

### All-Welded Aluminum Gondolas Provide More Freight At Less Weight

Coal-hauling aluminum freight cars being built by Pullman, Inc. for the Southern Railway System will provide a 30-ton greater payload. The aluminum body bolsters and crossbearers are bolted and riveted to the sill, but the remaining 200 parts are welded. Linde Company's high-speed Heliarc cutting process eliminated the need for dies to form the sole plates.

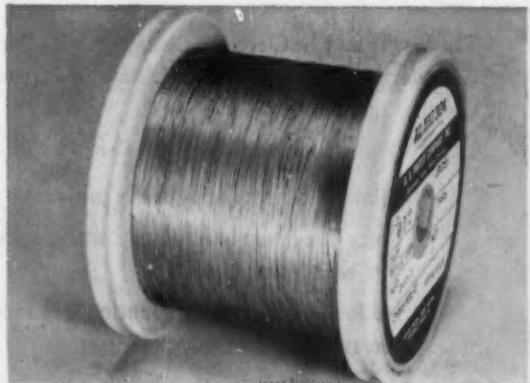
WRITE NO. 577 ON INQUIRY CARD—PAGE 34



### Investment In Returnable Spools Reduced By 73%

Development of a plastic spool has reduced by 73% the deposit formerly required of H. K. Porter customers. Users of five pound spools were paying a \$1.50 deposit; the new spool represents a 40¢ investment. The Alloy Metal Wire Works uses it to put-up stainless steel, monel, nickel and other alloys. A further advantage is realized because no equipment changes are necessary.

WRITE NO. 578 ON INQUIRY CARD—PAGE 34



### New Corrugated Box Design Increases Storage Space 40%

American Machine and Foundry Co., Little Rock, Ark., had enough storage space but the boxes in which it shipped its bicycles were not strong enough to stack more than 12 feet high. A new inner packing solved the problem. It provided greater protection and higher stacking increased storage space 40%. Box is supplied by Hoerner Boxes, Inc.

WRITE NO. 579 ON INQUIRY CARD—PAGE 34



# CORROSION-PROOF PROTECTION WITH CLEVELAND CONTAINERS



Illustrated are telescope VPI containers used by Cleveland Rock Drill plant, LeRoi Division, Westinghouse Air Brake Co., with spare parts they protect.

*Are you having trouble protecting precision parts from RUST and CORROSION?*

The answer may be Cleveland Containers with liners treated with VPI . . . Vapor Phase Inhibitor . . . which are both economical and highly effective against corrosion.

Use of VPI containers also have three *extra* money-saving advantages:

1. Eliminate the need of heavy protective oils or greases.
2. Parts are clean and ready when removed from the VPI container.
3. No loss of the rust-preventing VPI factor when parts are removed or replaced.

Constructed of quality fibreboard with metal ends, the 2-piece containers, shown above, are made in a wide range of diameters and lengths to "fit" a specific part or product. VPI containers can be labeled with preprinted wrappers, direct printing, or plain color wraps.

*For detailed information about these containers, write our nearest plant.*

## THE **CLEVELAND CONTAINER** COMPANY

Plants and Sales Offices:  
Cleveland  
Detroit  
Chicago  
Memphis  
Los Angeles  
Plymouth, Wis.  
Jamesburg, N.J.  
Fair Lawn, N.J.

6281 BARBERTON AVE. • CLEVELAND 2, OHIO

ALL-FIBRE CANS • COMBINATION METAL AND PAPER CANS  
SPIRALLY WOUND TUBES AND CORES FOR ALL PURPOSES

CLEVELAND CONTAINER CANADA, LIMITED  
Plants & Sales Offices: Toronto & Prescott, Ont. • Sales Office: Montreal

For More Information Write No. 580 on Inquiry Card—Page 34

### Packaging Costs Reduced With Stretchable Bag



Substantial reductions in packaging costs have been realized by the Smith-Douglas Company of Norfolk since they began packing fertilizers and agricultural chemicals in multi-wall sacks made with stretchable paper. The new bags have reduced breakage and damage throughout the manufacturing cycle as well as in the shipments to customers. The bags are made of Clupak extensible paper manufactured by West Virginia Pulp and Paper Company. Write No. 737 on Inquiry Card—Page 34

### One-Trip Containers Save Three Ways



Disposable, one-trip bottles and wire-bound boxes to replace returnable packages brought impressive economies to a New Jersey chemical manufacturer. The bookkeeping expense of returnable cases, the conditioning for re-use, and the space to store empty containers were all eliminated. The new containers meet the strict I.C.C. regulations covering shipments of volatile and corrosive chemicals.

Write No. 738 on Inquiry Card—Page 34



It's easy and economical to add punch to your packages, color to your cartons with appealing Safetex Printed Tape. For very few extra pennies, your *exclusive* Safetex Printed Tape design can advertise your company or product at a low, low cost . . . discourage pilferage of shipments . . . be helpful in tracing lost shipments . . . make in-warehouse identification easier for your customers . . . be effective in color coding production runs. Appealing Safetex Printed Tape is available in one, two and three color printing. On any of 10 handsomely colored

stocks, in all popular widths and weights. For proof of Safetex Printed Tape quality and popularity, write for sample folder or call your Safetex distributor.

## SAFETEX PRINTED TAPE



CENTRAL PAPER COMPANY  
MENASHA, WISCONSIN

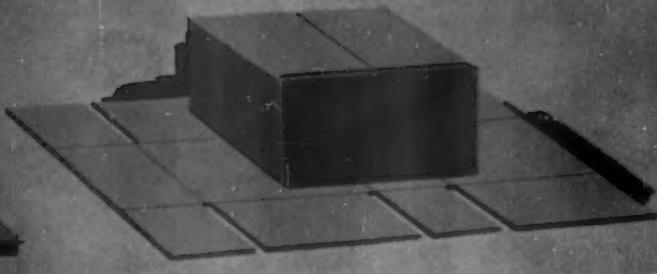
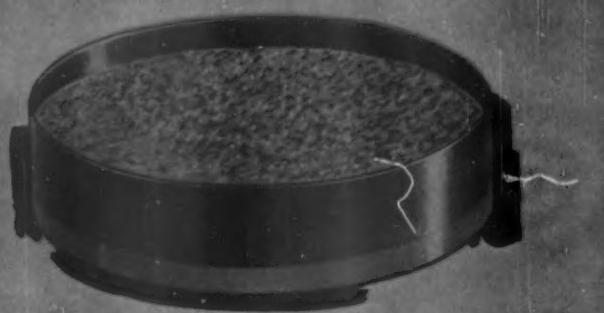
Manufacturers of Safetex superstandard gummed tape, Security standard grade gummed tape, Glassweb, Glasstex and Glassline reinforced tapes, Holiday Christmas wrap and tape, Triad matched bags, wrap and tape, adding machine rolls

For More Information Write No. 581 on Inquiry Card—Page 34

MAY 23, 1960

For More Information about ad on following page Write No. 582 on Inquiry Card - pg. 34-431

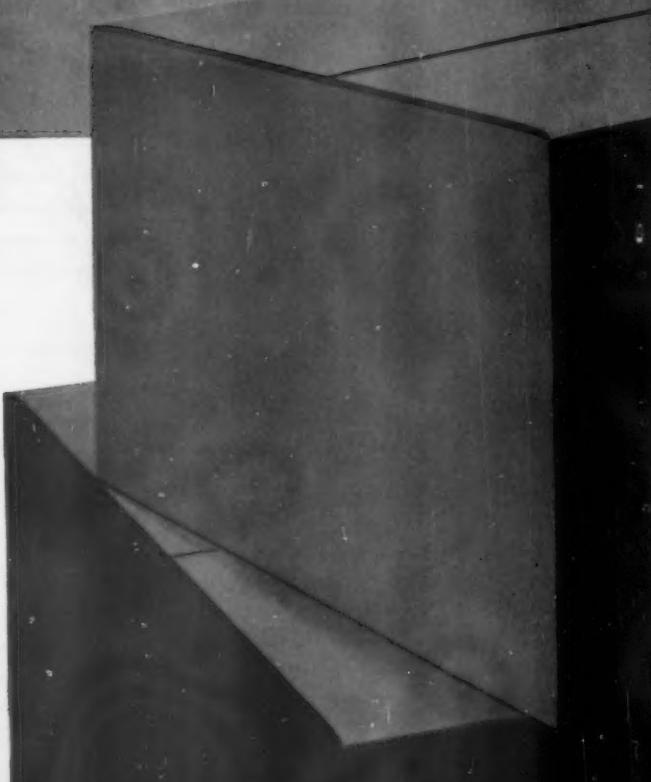
# ST. REGIS® TREE TO ST. REGIS BOX...



The corrugated box you get from St. Regis is the finest that money can buy. Here's the big reason:

St. Regis exercises strictest quality control *every step of the way* from forest to finished container. We ourselves grow the trees that produce the pulp that makes the linerboard for your box. No possible "bugs" in a set-up like this. Moreover, St. Regis corrugated box plants use an exclusive 18-point testing program that assures highest quality . . . always.

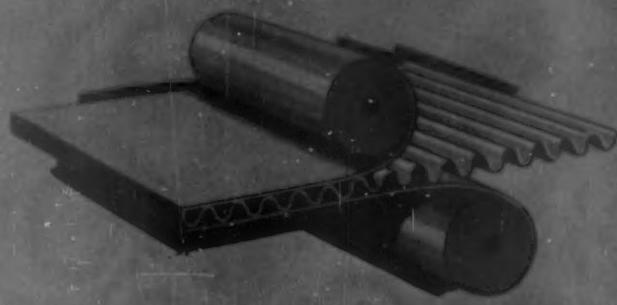
St. Regis is thoroughly equipped to study your product and create the ideal shipping container for its shipping, storing, stacking, handling, and selling. When you need corrugated boxes of any kind, call on St. Regis. Use *our* imagination.



# QUALITY CONTROL ALL THE WAY



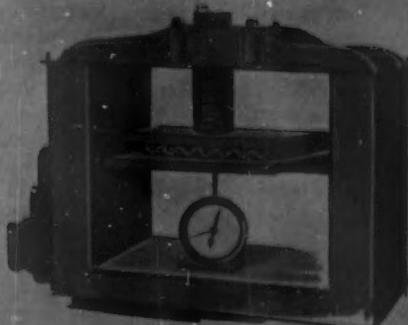
LINERBOARD



CORRUGATION



PRINTING



From a nationwide family of fine St. Regis corrugated plants, you'll gain in many ways: Well-seasoned, imaginative designers serve you on both local and national levels • Consistent quality is assured from St. Regis tree to St. Regis box • New packaging materials continually emerge from a fully staffed research department • And you'll enjoy working with the friendly, experienced people who are the St. Regis Container Division!

*Anything goes . . . in a St. Regis container!*

## CONTAINER DIVISION

**St. Regis**   
PAPER COMPANY

150 EAST 42<sup>nd</sup> STREET, NEW YORK 17, N.Y.

PLANT LOCATIONS: BIRMINGHAM, ALA. • FULLERTON, CALIF. • SALINAS, CALIF.  
JACKSONVILLE, FLA. • CHICAGO, ILL. • DUBUQUE, IOWA • HAGERSTOWN, MD. • MINNEAPOLIS, MINN.  
BUFFALO, N.Y. • COHOES, N.Y. • CANTON, OHIO • CLEVELAND, OHIO • COSHOCTON, OHIO • NEWARK,  
OHIO • CRAFTON, PENNA. • MT. WOLF, PENNA. • PITTSBURGH, PENNA. • DALLAS, TEXAS • GARLAND,  
TEXAS • TACOMA, WASH. • MILWAUKEE, WIS. • GRAFTON, W. VA.

**Corrugated Box  
Avoids Shipping Damage**



Damage in shipment was averted by a telephone booth manufacturer. A corrugated shipping container, designed by Gaylord Container Division, includes a corrugated base made up of four die cut pads. The booth is held upright by a single piece of wood. Two half-slotted cartons are then slipped over the top of the booth and secured to the base for final shipment.

Write No. 739 on Inquiry Card—Page 34

**Shipping Costs Cut With  
Light-Weight Material**



Electric typewriters are being packaged in a plastic material, Dylite expandable polystyrene. The plastic, a product of Koppers Company, is molded to the contours, thus holding movable parts firmly in place. Shipping costs have been substantially reduced because the material is lightweight. It is also shock-absorbent, water-resistant and has insulating qualities.

Write No. 740 on Inquiry Card—Page 34

**Shipping Carton Weight  
Reduced By 13 Lbs.**



Photographic and graphic arts chemicals are being shipped by the Philip A. Hunt Company in lightweight, plastic containers. An additional reduction in weight is achieved because the shipping carton requires less protective padding. Time and money is also saved through the use of screen printing directly onto the plastic containers which are supplied by Plax Corporation.

Write No. 741 on Inquiry Card—Page 34



**the more  
you buy  
the more  
you need**



# **ROADWAY**

... dependable transportation linking the industrial centers of the nation



**SPECIFY ROADWAY  
ON FULL TRUCK AND  
LTL SHIPMENTS**

for data  
on Roadway service  
to your area,  
write or call:

**home office: ROADWAY EXPRESS, INC. • 147 PARK STREET • AKRON, OHIO**

For More Information Write No. 583 on Inquiry Card—Page 34

YOU GET MORE FROM MEAD



YOU GET MORE  
FROM MEAD  
...THE MOVING FORCE  
IN PAPER AND  
PACKAGING



**OCTAGONAL MEAD CONTAINER STACKS TWO TIERS HIGHER, COSTS 10% LESS!**

Mead Containers engineered this special octagonal corrugated shipping container to carry four columns of rigid aluminum foil containers produced by Ekco-Alcoa Containers, Inc. The Mead cartons had to stack two tiers higher than the previous packages... yet not increase unit costs or hamper any material handling or packaging

procedures... Mead's octagonal design achieved the desired stackability . . . reduced unit cost 10% . . . And remember, only Mead containers, with the Mead Bonded Container seal, are guaranteed with a \$500,000 bond to meet the quality standards of Rule 41 and Rule 5 . . . from Mead's network of 19 container plants.

A DIVISION OF THE MEAD CORPORATION

For More Information Write No. 584 on Inquiry Card—Page 34

MAY 23, 1960

**MEAD**  
*containers*



## they just made me vice president in charge of labels!

"You don't believe me? Well anyway, let's say they practically made me Vice President after I started ordering from Ever Ready. We don't have a label problem any more. Ever Ready never lets us down on service, quality or reasonable price."

Whatever your label requirements, Ever Ready can fill the need. Packing, shipping, pressure-sensitive, pin-feed "Automatic Labels," fund raising, heat seal caution... Ever Ready produces every type of label!

Send today for our amazingly helpful idea kit!



**EVER READY LABEL**  
CORPORATION

357 Cortlandt Street, Belleville 9, N. J.

Gentlemen:

- Please send me information regarding Red-E-Stik pressure sensitive case histories.
- Please send me information on how to swap samples of our label for 100 humorous labels.

Name .....

Company .....

Street Address .....

City, Zone, State .....

For More Information Write No. 585  
on Inquiry Card—Page 34

436

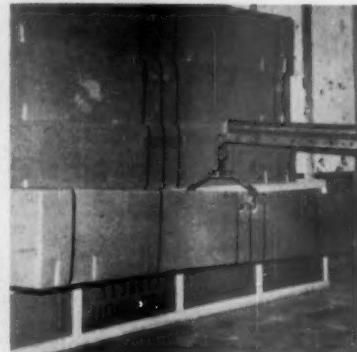
### Liners In Roll Put-Ups Eliminates Bottleneck



Polyethylene lines for corrugated cartons and fiber drums, perforated and put up on a roll, have increased threefold the liner inserting operation at Cotto-Waxo Co. The liners are removed from the roll much the same way as paper hand towels would be—in one quick movement. The workman pulls the liner over a mandrel, inserts both into the carton and removes mandrel. The roll put-up liners are manufactured and sold by Bennis Bro. Bag Company.

Write No. 742 on Inquiry Card—Page 34

### Light-Weight Container Saves Labor of Four Men



Carpeting rolls weighing 1000 lbs. and up to 15 ft. in length are being packaged in corrugated boxes. Four men have been eliminated in the box set-up job; storage area required for packaging material has been reduced 30%; packaging personnel no longer wrap the carpet in kraft

paper because the boxes are tight and keep out dust and dirt. The new container was designed and is supplied by Gaylord Container Corp.

Write No. 743 on Inquiry Card—Page 34

### New Marking Technique Speeds Package Stenciling



Clear and precise package markings on both porous and non-porous surfaces are applied by roller stenciling tools developed by Diagraph-Bradley Industries, Inc. The new technique includes a foam rubber roller which is ink-fed through a squeezable plastic handle. The only other device needed is a stencil cut from oiled board, made of a specialty grade paper developed by the Hollingsworth & Whitney Division of Scott Paper Co.

Write No. 744 on Inquiry Card—Page 34

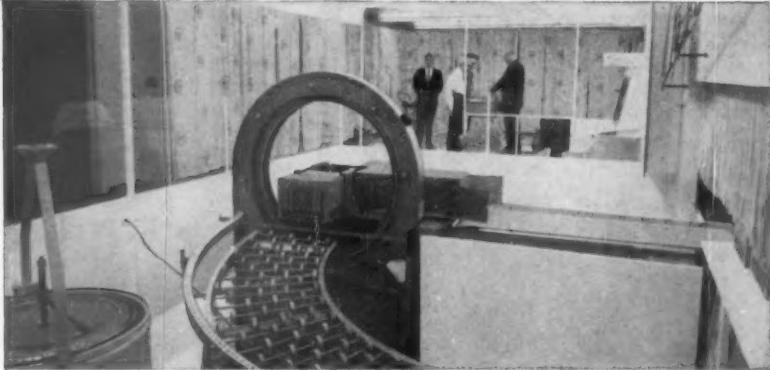


"No, we didn't get the contract, chief, but the day wasn't a total loss, I took him for eight bucks on the golf course."



## Intricate Exhibit arrives promptly... in perfect working order!

U. S. Steel display components picked up in Chicago and Pittsburgh are delivered in New York ready to operate.



*America's Most Recommended Mover*

● Electronic intricacy of one major component is the key to the automatic strapping exhibit which U. S. Steel's Supply Division entrusted to Mayflower's moving care. It could easily be damaged in transit if not carefully handled. But when Mayflower delivered it from Chicago to New York City, it arrived in perfect condition and worked the first time it was plugged in.

This type of service is an every day occurrence with Mayflower's skilled packing and handling, plus the protection and cushioning provided by Mayflower's new "air-ride" van. To save time and money, call Mayflower, to move *your* valuable exhibits.

*Ask for "17 Reasons Why" Booklet . . . a practical exhibit guide*

AERO MAYFLOWER TRANSIT COMPANY, INC. • INDIANAPOLIS, INDIANA

For More Information Write No. 586 on Inquiry Card—Page 34

For More Information about ad on following page Write No. 587 on Inquiry Card - pg. 34+

# ACME STEEL

# idea leader

*strapping,  
stitching,  
framing—*

three target areas for  
cost reduction  
throughout industry.

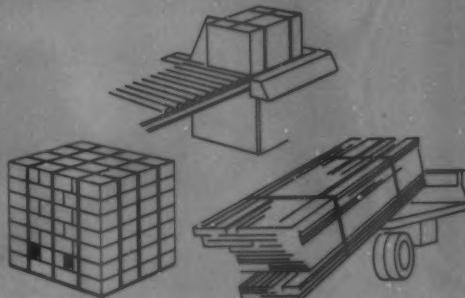
Here's how Acme Steel,  
one of the nation's  
major specialty steel  
companies, is  
leading the way . . .

## IDEAS for mechanization of closing, bundling, baling, bracing, unitizing, tying and reinforcing

How long is a production line? Today it doesn't stop with the finished product. *Packaging and shipping* must also be considered part of the manufacturing process.

To secure, protect and unitize shipments, no system has so much to offer as Acme Steel Strapping. Powerful, lightweight straps bind even the most complex shapes. A wide variety of strapping machines and tools—automatically or manually operated—meet the special requirements of any installation.

No less important is the service offered by your Acme Idea Man. He has a drawing account on the industry's richest fund of experience. Chances are he's successfully answered many a problem like yours. Look to the leader—call your Acme Idea Man.

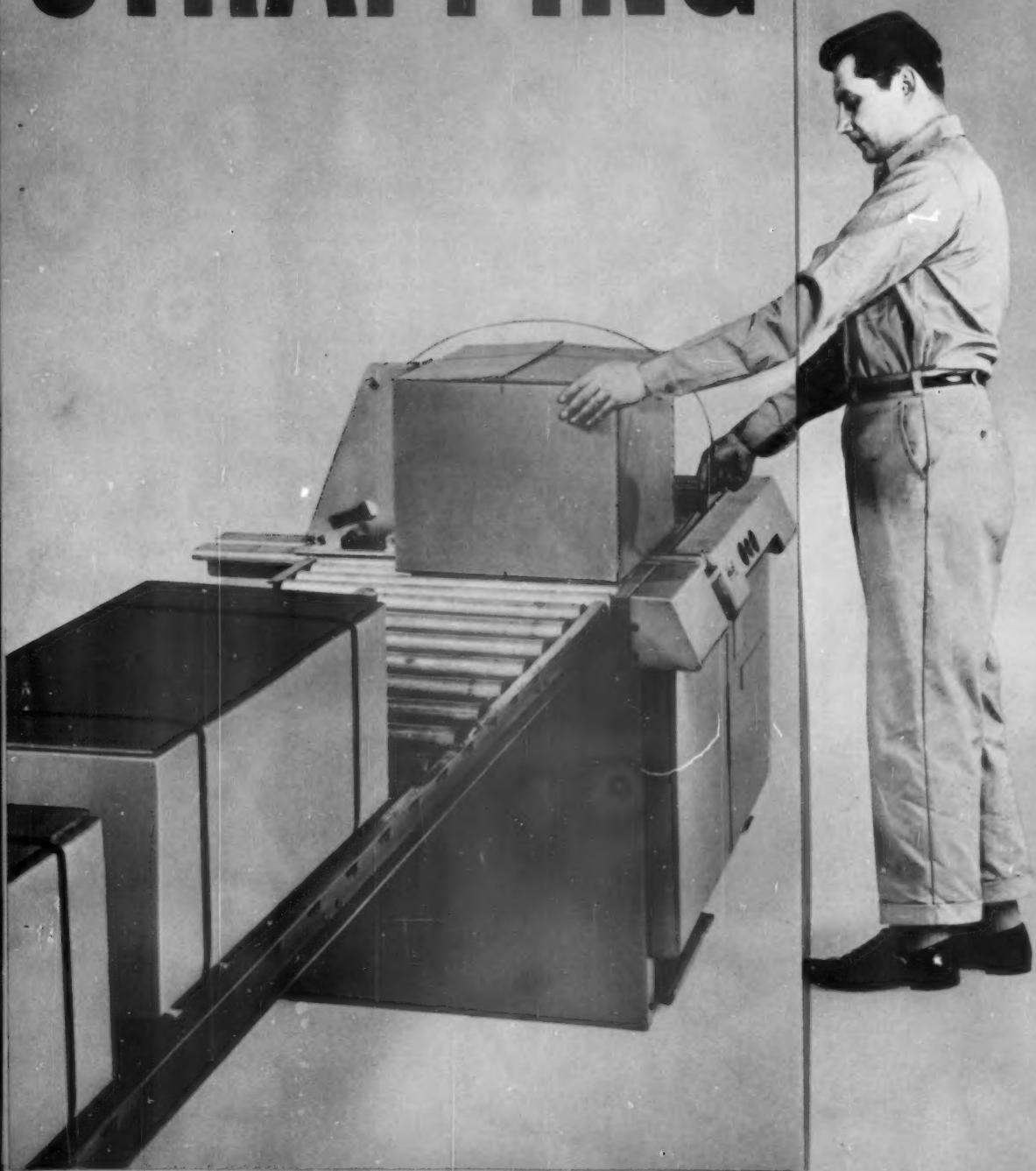


**ACME  
STEEL**

IDEA LEADER IN  
**STRAPPING**

ACME STEEL COMPANY  
13511 Perry Avenue, Chicago 27, Illinois

in . . . .  
**STRAPPING**



**ACME  
STEEL**

# idea leader

*strapping,  
stitching,  
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three target areas for  
cost reduction  
throughout industry.

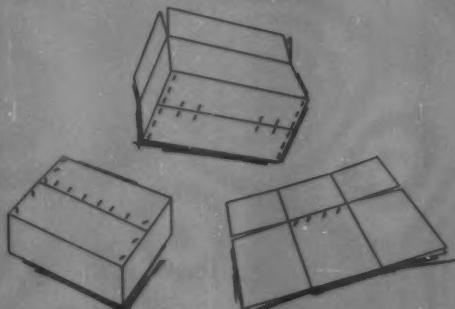
Here's how Acme Steel,  
one of the nation's  
major specialty steel  
companies, is  
leading the way . . .

## IDEAS for handling closure and fastening jobs with machine-gun efficiency

Of all the closure methods used by industry, no other meets the combination of talents that belong to wire stitching. Using coils of rust-resistant wire, high-speed machines cut and drive thousands of stitches without re-loading. In speed, cost-per-closure and reliability, this method is superior to tape, glue or staples.

Acme Steel's leadership in this field extends not only to stitching wire but to machines as well. Whether it's book binding, box closure or product assembly fastening—Acme Steel's 80-year background in closure methods holds the answer.

Have you a closure or fastening problem that refuses to be licked? Look to the leader—call your Acme Idea Man.

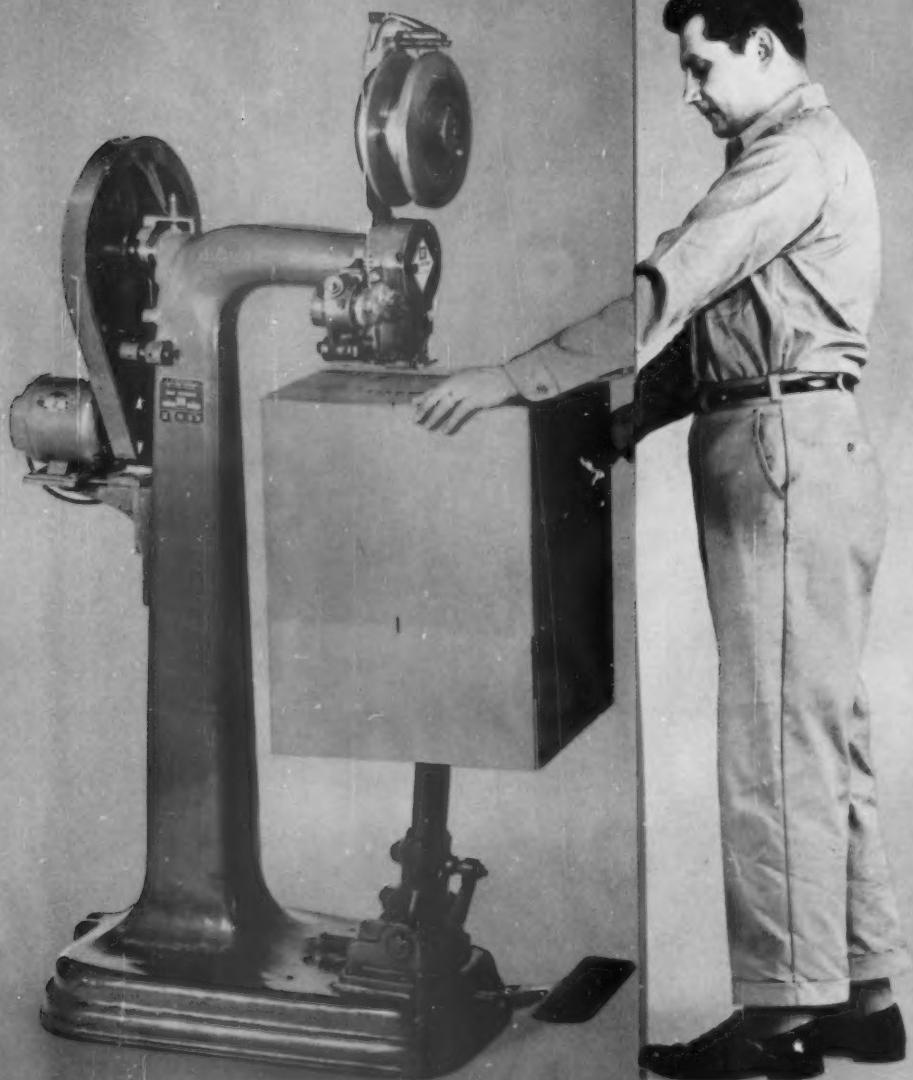


**ACME  
STEEL**

IDEA LEADER IN  
**STITCHING**

ACME STEEL COMPANY  
13511 Perry Avenue, Chicago 27, Illinois

in . . .  
**STITCHING**



# ACME STEEL

# idea leader

*strapping,  
stitching,  
framing—*

three target areas for  
cost reduction  
throughout industry.

Here's how Acme Steel,  
one of the nation's  
major specialty steel  
companies, is  
leading the way . . .

**IDEAS** for building structures  
and equipment fast and easy  
with unskilled labor

Any man can expertly put together AIM Brand Slotted Angle. Use this versatile framing material to build scores of structures that every plant needs—from simple storage racks to complex cages and engineered mezzanines.

AIM Brand is made of galvanized, cold-reduced steel that's bolted together after a simple cutting operation. Precision-spaced holes, in a special pattern, offer maximum fastening versatility without sacrificing strength. And its  $\frac{3}{8}$ " heat-treated, galvanized bolts have full-load shoulders and 2000 pounds safety load capacity.

Acme Steel offers you more in every way: proved design; practical in-use ideas; engineering assistance for special applications; convenient local stocks. Look to the leader—call your AIM Brand distributor.



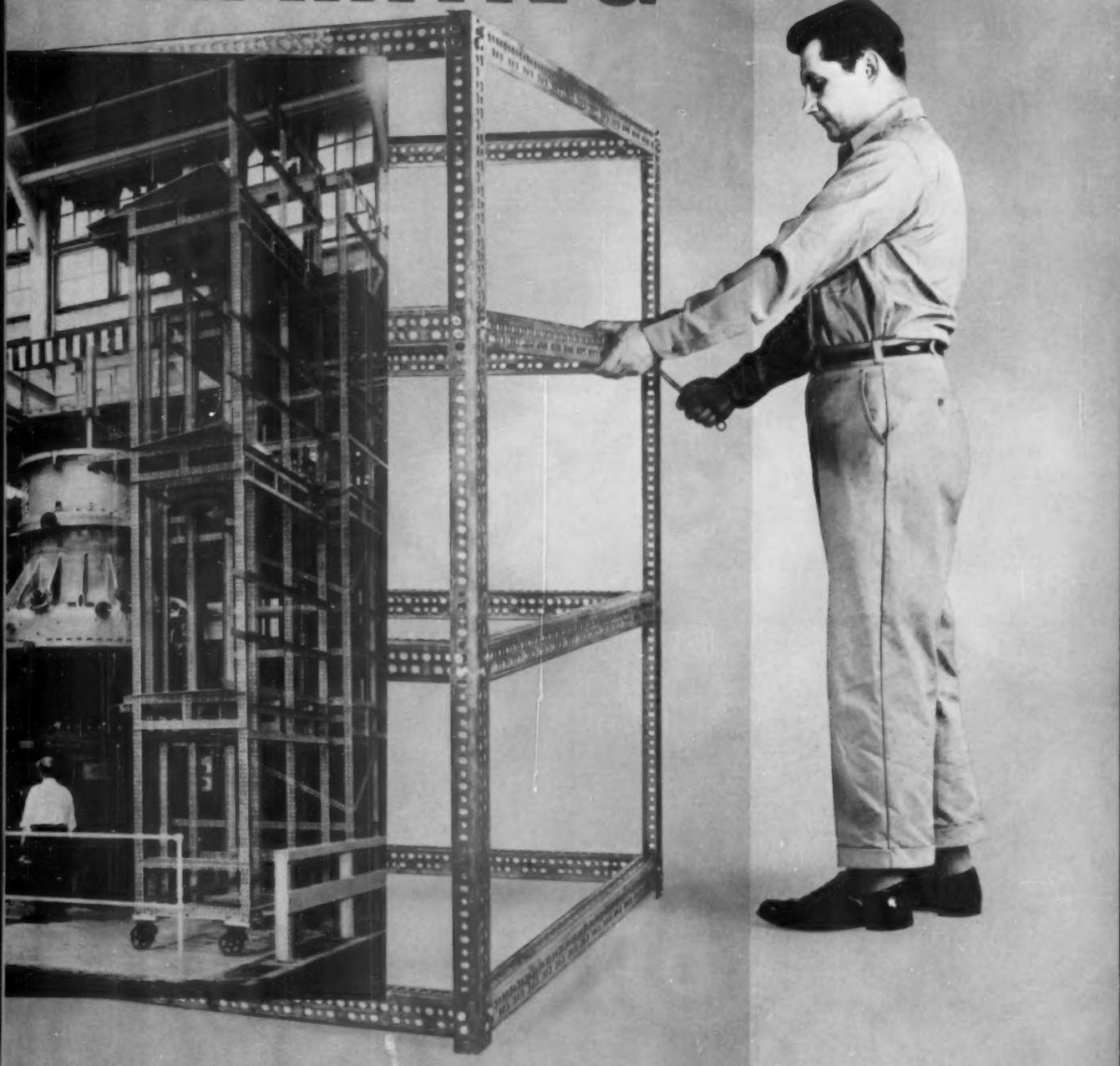
**ACME  
STEEL**

IDEA LEADER IN  
**FRAMING**

**AIM**  
BRAND

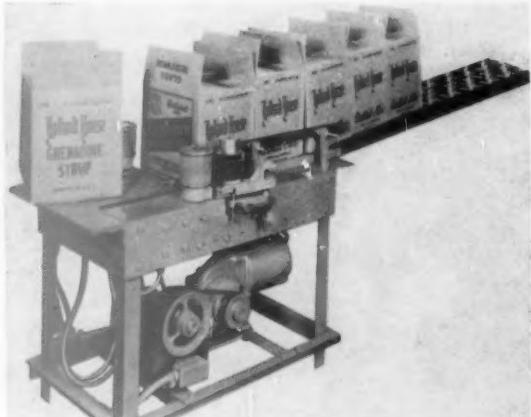
ACME STEEL COMPANY  
13511 Perry Avenue, Chicago 27, Illinois

in . . . . .  
**FRAMING**



# V VALUE ANALYSIS A

## Packaging and Shipping



### Carton Marking Capacity Doubled With In-Line Case Printer

Automated machinery plays a key role in Holland House Sales Company's production of 2½ to 3 million bottles of cocktail mixes each year. A recent improvement by automation occurred with the installation of an in-line case printer in the carton marking operation. It was specially designed and manufactured by Industrial Marking Equipment Company and turns out marked cartons at the rate of 45 a minute—double the previous rate.

**WRITE NO. 588 ON INQUIRY CARD—PAGE 34**



### Electronic Equipment Shipper Saves \$75,000

A major shipper of high-value electronic equipment has reduced time, manpower and shipping expense through utilization of newest advancements in long-distance moving van equipment. Custom designed and manufactured for Aero Mayflower Transit Company, the savings in crating costs was estimated to be \$75,000. Many assembled units were loaded and unloaded without first being dismantled.

**WRITE NO. 589 ON INQUIRY CARD—PAGE 34**

---



### Packaging Costs Reduced 25% Plus Greater Protection Against Puncture

Protective packaging has resulted in a 25% reduction in costs for Terardo Company. The packaging supplied by Bemis Bro. Bag Co. also provides shock-absorbing qualities and protection against package puncture. The pre-formed units "float" the converters, in suspension, during transit. An addition benefit is the ease with which the product can be removed for inspection and returned to the master container.

**WRITE NO. 590 ON INQUIRY CARD—PAGE 34**

For More Information about ad on facing page Write No. 591 on Inquiry Card - pg. 34→

**PURCHASING**

**This is only one proof  
of GAYLORD quality**

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . .  
which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide  
organization of packaging talents, devoted to delivering the  
most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?



*Seal illustrated above used for shipping containers  
conforming to Uniform Freight Classification No. 41.*



**CROWN ZELLERBACH CORPORATION**  
GAYLORD CONTAINER DIVISION



IN CANADA - CROWN ZELLERBACH  
CANADA, LTD. VANCOUVER, B.C.

HEADQUARTERS, ST. LOUIS  
PLANTS COAST TO COAST

**Strapping Costs Cut 50%  
With Oval Wire**



Over a two-year period a Texas lumber company has been able to cut the cost of strapping materials in half. The A. J. Gerrard Oval steel strapping has provided this company with greater lineal feet per pound of strapping. A special tool for twisting and cutting the strapping has increased the saving by eliminating two to three feet of waste per package. An operation that formerly took 4½ man-hours now takes 10 minutes.

Write No. 745 on Inquiry Card—Page 34

**Plastic Foam Container  
Cuts Shipping Costs**



Shipment and handling damages have been almost completely eliminated from a line of Bell & Howell cameras. This is possible through the use of a new packaging cocoon molded of plastic foam. The foam is Pelaspan, expandable polystyrene made by The Dow Chemical Company. Elimination of the conventional carton reduces packaging time by half and a 25% weight reduction reduces shipping costs.

Write No. 746 on Inquiry Card—Page 34

**Packaging System Saves  
90% In Pre-Use Storage**



A packaging system which is a combination box and bag has resulted in considerable savings for flour milling companies. It has saved 10% on filled package warehouse space; up to 40% savings over existing material costs; and up to 90% saving in empty package warehouse space due to the compactness of the container. The new system was developed by St. Regis Paper Company.

Write No. 747 on Inquiry Card—Page 34



## SOLVE DOZENS of Production Problems with

New, Versatile  
**kleen-stik®**  
Pressure-Sensitive  
**2-SIDED ADHESIVES**  
**IN TAPE FORM**

### Instantly Bonds Anything...to Anything!

Wherever you use an adhesive — you can probably do the operation faster, better, more economically with new KLEEN-STIK 2-sided adhesives! Thin, tough film double-coated with special moistureless adhesive, sticks tight to most surfaces. Replaces and outperforms glues, cements, gummed tapes, tacks, clips, nails, screws, staples, etc. — in hundreds of everyday applications!



### SAVE TIME AND MONEY IN ALL THESE OPERATIONS!

- Mounting
- Attaching
- Anchoring
- Fastening
- Holding
- Splicing
- Joining
- Assembling

**SPECIAL  
OFFER!**  
Prove KLEEN-STIK  
in your own plant.  
Send \$1.00  
for regular \$1.79  
108 ft.  
Dispenser Pack.

"Customized" to your needs!  
Available in handy Dispenser  
Pack or large rolls, in stand-  
ard  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", or 1" width,  
with exclusive "Finger-Lift"  
edge. Also in bulk rolls up  
to 34" wide.

**kleen-stik Products, Inc.**

Dept. P 7300 West Wilson Avenue • Chicago 31 Illinois

For More Information Write No. 592 on Inquiry Card—Page 34

**Specially Designed Boxes  
Reduce Costs by 25%**



By switching to specially designed corrugated boxes for packaging its line of adding machines, Smith Corona has effected economies which add up to an overall 25% of the packaging bill. The new boxes also solved the problem of hidden transit damage. Union Bag-Camp Paper designed a box which reduced the number of inserts from 11 to two. The reduction of physical steps and shortening of time needed to package a unit has made the operation much more efficient.

Write No. 748 on Inquiry Card—Page 34

PURCHASING



puts every other  
cargo schedule  
in the shade!

## New Pan Am Jets cut world-wide delivery time 40%!

Pan Am opens up with the most complete Jet cargo schedules of any line today. With more new Jets, Pan Am brings almost every major city in the world within 12 hours of the U.S.A.

*For instance:*

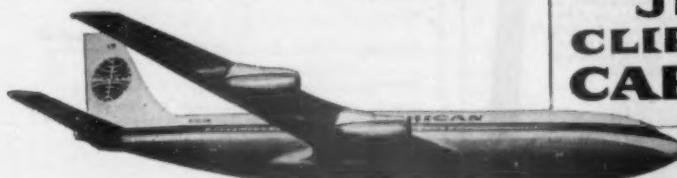
Caracas from New York.....now 4½ hrs.  
Amsterdam from New York....now 8½ hrs.  
Honolulu from San Francisco.. now 5½ hrs.  
London from Los Angeles ....now 11½ hrs.

POINTS FROM THE U.S. - MORE SERVICE (From electronically checked reservations to doorstep pickup and delivery, your goods are in the hands of the most careful and experienced men in the business.) No wonder Pan Am carries nearly twice as much international air cargo as any other carrier!

Take advantage of Pan Am's faster, better service now. Call your cargo agent, freight forwarder or Pan Am direct. Get your shipment *aboard today—abroad tomorrow!*

via the WORLD'S MOST EXPERIENCED AIRLINE

Pan Am Jet Clipper\* Cargo gives you these exclusives, too: MORE SPACE (10,000 pounds capacity with every new Jet plane!) • MORE JETS • MORE FLIGHTS • MORE SHIPPING



\*Trade Mark, Reg. U. S. Pat. Off.

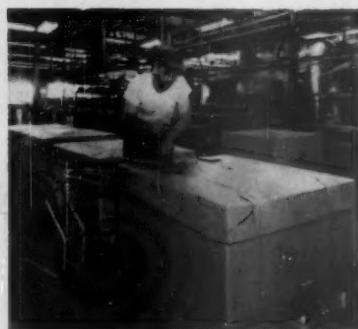
**Bottle Caps Tightened By Long Wearing Rollers**



Automation in the Hazel Bishop plant was accomplished by use of Resistoflex rollers to tighten caps on bottles of nail polish traveling at the rate of 120 per minute. Frequent shut-down of the line to replace rubber rollers has been eliminated with the change to polyvinyl rollers which are non-adhesive and have a longer life. They are inert to oil and solvents and provide resistance to wear and abrasion.

Write No. 749 on Inquiry Card—Page 34

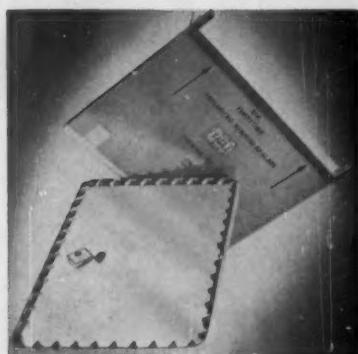
**Strapping Tool Reduces Waste Material**



A substantial savings in packaging materials was achieved at Tecumseh Products Company in Michigan by the use of A. J. Gerard oval steel strapping. Each 100 lbs of the material delivered three times the lineal footage of other types. A single tool is used to tension, twist and cut the strapping. The company estimates that it takes about two minutes to strap an average pallet pack.

Write No. 750 on Inquiry Card—Page 34

**Packing Material Reduces Labor Costs by 50%**



A manufacturer of mirrors reduced his labor costs by 50% through the use of a slotted packing material. Customers of the manufacturer have expressed complete satisfaction with the new method of packing and reports of breakage in transit are almost unheard of. The specially formed material is supplied by Vanant Company, Inc. Milwaukee.

Write No. 751 on Inquiry Card—Page 34



It's a fact: Piggyback shipments arrive faster, more dependably, more damage-free. Here's another fact—nobody knows more about Piggyback than Clipper, or is better equipped for it. See for yourself; route your next order via Clipper Piggyback.

*Clipper* CARLOADING COMPANY  
General Offices: 323 W. Polk St., Chicago 7, Ill.  
Phone: HArrison 7-7780

For More Information Write No. 594 on Inquiry Card—Page 34  
448

## How to Get Your Name on the Mailing List

and receive your own personal copies of PURCHASING as soon as issued!

Why wait to see pass-along copies when it is so easy to have your own subscription? You can read PURCHASING at your own leisure . . . and build a valuable idea file of helpful articles, or save the entire magazine.

The know-how you accumulate this way will be returned many times over by making your work easier . . . and more profitable.

Mail this Coupon TODAY

Subscription Manager, PURCHASING  
205 E. 42nd St., New York 17, N.Y.

Send me PURCHASING every-other-week, as fast as issued, at your bargain rate of only \$4 for the 26 copies.

Payment enclosed

Send bill later

Name .....

Title .....

Company .....

Principal Product .....

Address .....

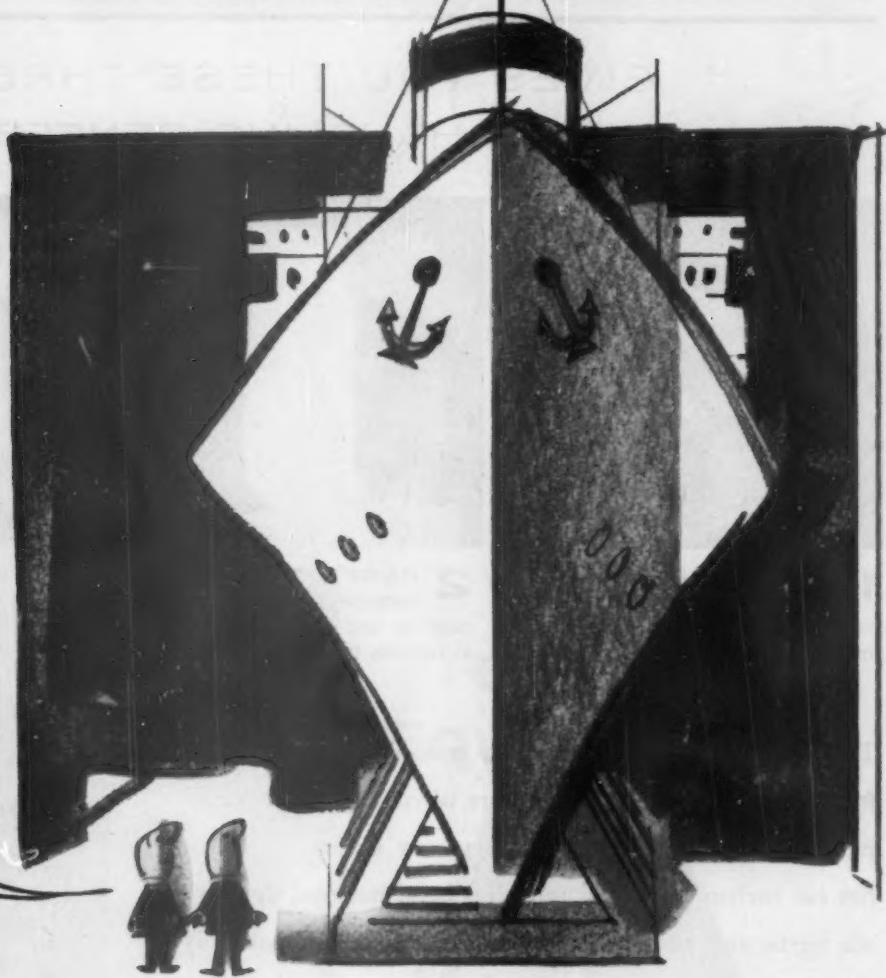
City &

State .....

Send Purchasing to my home address: .....

## SHIPPING DEPARTMENT

Frankly, Harry,  
this one may  
even stop  
the Bostitch  
Economy Man



Even if the packaging problem seems too big to handle, it's worth your while to check with a Bostitch Economy Man for suggestions.

One did help work out a giant corrugated carton for a line of boats. Packing time was reduced 50%. Out of 3000 shipments, 2998 arrived at their destination completely safe. Two had minor mars. With wooden crates, damage in transit was a common headache for the company and its dealers.

Whatever you pack or ship, the Bostitch Economy Man can probably help you. Working with a wide variety of Bostitch staplers and staples—and with the world's largest fund of stapling experience at his disposal—he'll come up with a time and money saving answer if anyone can.

If you have shipping room problems, ask your Bostitch Economy Man to look them over. He's listed under "Bostitch" in the telephone directory. Call him.

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
\* With every Bostitch machine you get... \*  
\* the right combination for your needs from 800 sta- \*  
\* pliers and over 200 staples... nation-wide parts, \*  
\* service and technical aid backed by the industry's \*  
\* most modern factory... assurance that Bostitch \*  
\* products will operate to your complete satisfaction. \*

*Fasten it better and faster with*

**BOSTITCH**<sup>®</sup>

STAPLERS AND STAPLES

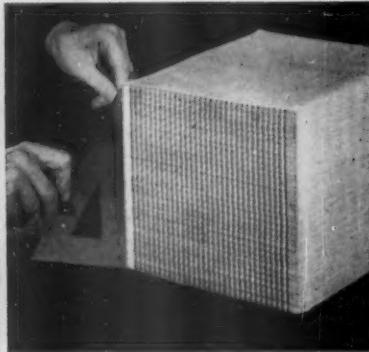
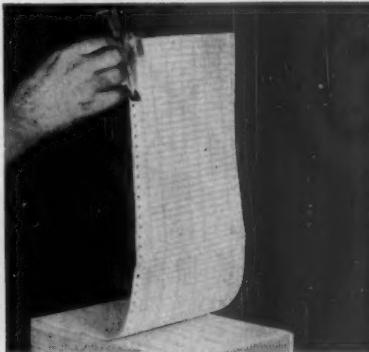
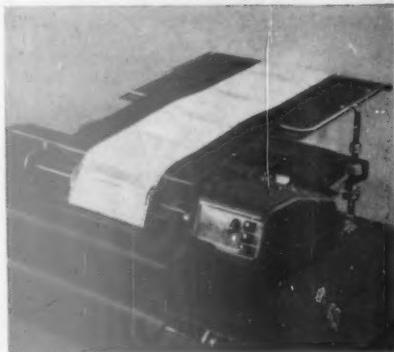
725 BRIGGS DRIVE, EAST GREENWICH, RHODE ISLAND

For More Information Write No. 595 on Inquiry Card—Page 34

NEW

# Moore Speediflex

GIVES YOU THESE THREE  
FORMS-HANDLING BENEFITS



**1 PERFECT FEEDING**—The entire set of parts and carbon feeds, naturally and in perfect alignment, around the writing platen.

**2 PERFECT REGISTER,** because there's no tenting or peaking, and both sides flow freely in natural, flexible movement.

**3 PERFECT REFOLDING** in neater square packs results from still another advantage—Moore's unique way of perforating the sets.

This Moore 'first'—a brand new concept—results in new forms-handling efficiency for users of continuous marginal punched forms. The revolutionary new dimension is the flex-cut carbon. It acts as a flexible bond between the various parts, and allows the Speediflex unit to flow naturally without 'tenting' or 'peaking,' aligning at the point of writing for perfect part-to-part register. This great new form introduces many other forms-handling benefits. For a demonstration, look up the Moore man in the telephone directory or write the nearest Moore office.

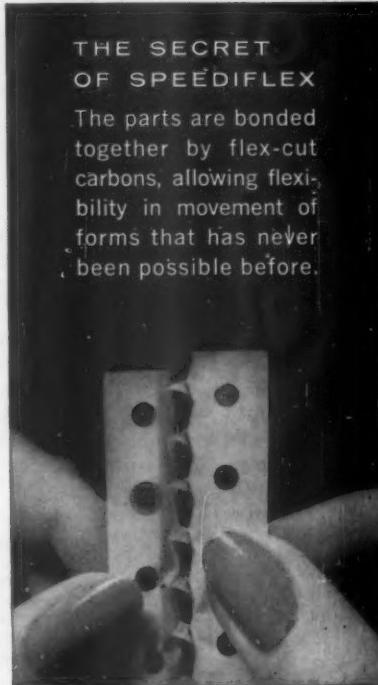
Speediflex is a patented product of Moore Business Forms, Inc.

MOORE BUSINESS FORMS, INC., Niagara Falls, N. Y.; Denton, Texas; Emeryville, Calif. Over 300 offices and factories throughout the United States, Canada, Mexico, Cuba, Caribbean and Central America.



Build control with

**MOORE BUSINESS FORMS**



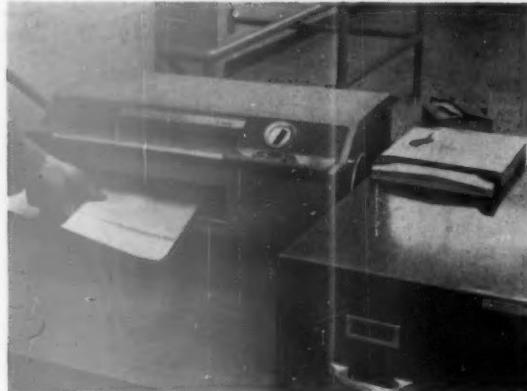


V

## Office Equipment

A

## Office Equipment



### Purchasing Paperwork Processing Improved 70% With Copying Machine

A 70% improvement in the purchasing and receiving of goods has been achieved by Superior Plating, Inc. since the installation of an electric copying machine procedure. One master copy is used and entries made in pencil as they occur. Extra copies needed for other departments are made up from the master. The copying machine is supplied by Minnesota Mining and Manufacturing Company.

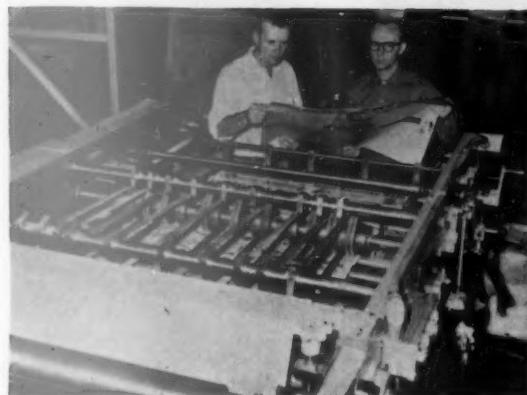
WRITE NO. 597 ON INQUIRY CARD—PAGE 34



### Modular Partitions Save Space And Improve Appearance of Office

A Boston insurance agency has improved the office environment and "found" space for additional agents and increased paperwork. Clever use of different kinds of Art Metal, Inc., standard equipment in individual combinations enabled the agency to breakup what was essentially a wide corridor type filing into different departments, each with its own special layout and work-flow pattern.

WRITE NO. 598 ON INQUIRY CARD—PAGE 34



### Lightweight Web-Fed Paper For Lithography Brings Economies

Neither lightweight paper nor web-fed lithographic presses are new. However, Jensen Printing Company, Minneapolis is achieving better quality and greater economy by coupling the two. With this type operation the work comes off the press ready for binding. In a recent instance of weight-saving, a cut of one-half pound was made in one catalog. The paper being used is a product of Ecusta Paper, Olin Mathieson Chemical Corp.

WRITE NO. 599 ON INQUIRY CARD—PAGE 34

# **COSCO...a better chair at a better price!**



Model 15-F  
Secretarial Chair **\$2995**  
(**\$31.95** in Zone 2)\*



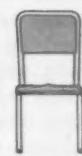
18-TA, \$49.95  
(\$52.45)\*



18-T, \$44.95  
(\$47.45)\*



20-LA, \$29.95  
(\$31.95)\*



23-L, \$15.95  
(\$17.95)\*



Comparable values  
in settees, sofas,  
chairs, tables.

\*(Zone 2: Texas and 11 western states)

MAY 23, 1960

For More Information Write No. 616 on Inquiry Card—Page 34

**HAMILTON COSCO, INC.  
COLUMBUS, INDIANA**

# V VALUE ANALYSIS A

## Office Equipment



### Intercom as Timekeeper Saves \$20,000 in First Six Months

An intercom system was recently installed as a timekeeping device and saved \$20,000 during the first six months. Worker picks up nearest instrument and calls in his clock number. After acknowledgement, he reports the part number, operation and pieces completed. A girl in the timekeeping center, upon hearing the clock number, picks up the job card and records the data as it is given over the intercom. Webster Electric Co., supplied and installed the intercom equipment.

WRITE NO. 602 ON INQUIRY CARD—PAGE 34



### Centralized Field Record-Keeping Has Eliminated Clerical Problem

Construction payrolls have always been a problem due to the difficulty in obtaining experienced clerical personnel in inaccessible areas. F. H. McGraw & Company has overcome this handicap with field locations reporting daily pay data to a central processing department. Teletype is used for transmitting the information. The tape is placed in an IBM tape to card punch. At the end of the pay period the cards are sorted by clock number and the payroll processed automatically, ending with a check for the worker.

WRITE NO. 603 ON INQUIRY CARD—PAGE 34



### Imprinting Tags With Selected Data Saves Drug Firm \$1000

Great care must be taken with the dating and proper labeling of drugs at Lederle Laboratories Division of American Cyanamid. A manifold tag system used with Dennison Dial-Set machines are saving the drug firm about \$1000 a year and providing a greater assurance of accuracy. The filling department orders the required number of tags for each scheduled filling from the duplicating department. The duplicating department dial-sets the correct information and imprints the information on the tags.

WRITE NO. 604 ON INQUIRY CARD—PAGE 34



## Give profits a lift with **THE CALL DIRECTOR** telephone!

The Call Director telephone is available in 18-button and 30-button models—in green, gray or beige.

Just look at the ways you can use the Call Director telephone to increase operating efficiency and profits . . .

- You can talk with others in your office, store or plant by merely pushing a button or dialing a number. If you get a busy signal, a special "camp-on" feature automatically connects you when the line is free.
- You can add another inside person to an outside call and have a three-way conversation. You save the time and bother involved in transferring calls back and forth.
- You can set up a telephone conference with as many as six people—at

the touch of a button. Several different conference groups can be arranged. No need to reserve meeting rooms. No lost time in corridors and elevators. You get down to business fast by phone, right at your desk.

- You can have as many as 29 outside, extension or intercom lines at your fingertips all the time. You get more done, because you don't have to leave your office so often.

**Never before could a business phone serve you so effectively!**

Learn how the new Call Director telephone with Bell System intercom can

be tailored to your firm's exact needs and improve its profit picture. Just call your Bell Telephone business office, and a Bell representative will bring you the whole story. No obligation.



This six-button telephone also offers a range of flexible intercom features.

**BELL TELEPHONE SYSTEM**



# V VALUE ANALYSIS A

## Office Equipment



### Automated Inventory Control Cuts Costs, Boosts Efficiency

Centralab, a division of Globe-Union, Milwaukee, which uses about 5000 parts for manufacturing electronic components, is saving the time of two people through the use of a Burroughs F1300 accounting machine programmed for inventory control. The exact status of every part can be determined at any time by simply referring to a single production and inventory card. The cards are kept up-to-date with the use of the machine.

**WRITE NO. 606 ON INQUIRY CARD—PAGE 34**



### Auto Agency Saves 400 Man-Hours With Recordkeeping System

A Paterson, N. J. automobile dealer is saving 400 man-hours a year as a result of the VISI-record system he installed. Although the number of active accounts has increased, one clerk still handles all statements, mailing them on the first day of the month instead of five days later, as was previously customary. In addition to the speeded-up operations, the clerk has taken on new duties.

**WRITE NO. 607 ON INQUIRY CARD—PAGE 34**



### Portable Dictating Equipment Helps to Make More Calls

Rising administrative costs are being offset at Aetna Life by providing claims adjusters with portable dictating equipment. It is supplied by The SoundScriber Corp. and relieves the adjusters of returning to the office to handle routine details. They dictate reports in the field, in their autos or at home and mail the discs to their offices. The extra time in the field means more cases can be handled by fewer people.

**WRITE NO. 608 ON INQUIRY CARD—PAGE 34**

# At last - a ballpoint especially designed for office use!

**NEW  
EVERSHARP!**

*Lightning*

**BALLPOINT PEN**

**ONLY THE EVERSHARP  
LIGHTNING GIVES YOU  
ALL THESE FEATURES:**

 Comfort grip for easier, effortless writing—prevents writing tension

 Porous ball point for speedier, neater work—designed to write "non-skid"

 Longer ink supply to cut refill expenses—nearly six inches of new high-density ink

 "Pocket Proof" design—available without clip to discourage pilferage



**FREE SAMPLES!  
WRITE ON YOUR LETTERHEAD TO:**

EVERSHARP PEN CO.

DEPT. B

JANEVILLE, WISCONSIN

**CHECK STYLE DESIRED:**

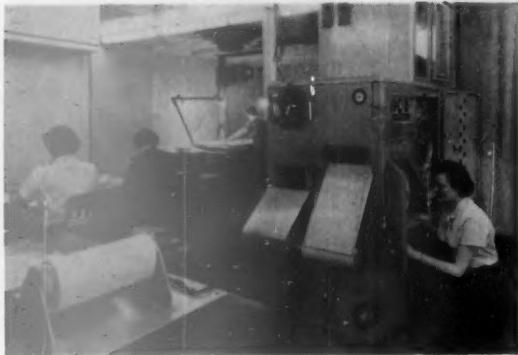
- Non-refillable, no clip—39¢ retail
- Refillable, no clip—45¢ retail
- Refillable, with clip—49¢ retail
- All three

*For the best writing ever...it's* **EVERSHARP!**

For More Information Write No. 609 on Inquiry Card—Page 34

**V**  
VALUE ANALYSIS  
**A**

## Office Equipment



### Aircraft Company Saves \$85,000 Yearly On Offset Printing

The Martin Co. of Baltimore is enlarging disposable microfilm onto a continuous roll of offset-paper-masters and saving \$85,000 a year with the method. The Copyflo continuous printer, a product of Haloid Xerox Inc., uses a roll of inexpensive, offset-paper-master stock, which is 2000 feet long by 12 inches wide. It is cut into individual masters for the runoff of multiple copies on offset duplicators.

**WRITE NO. 610 ON INQUIRY CARD—PAGE 34**



### Invoices and Shipping Documents Prepared Day Order Is Received

Greenfield Tap and Die has increased efficiency and avoided costly delays in processing 10,000 complicated invoices a month with the use of a computer. Punched-card entries for pricing, extending and invoicing are processed at millisecond speeds by the computer so that invoices and other shipping documents are correct and ready the same day orders are received. The Univac 60 computer is supplied by Remington Rand, Division of Sperry Rand.

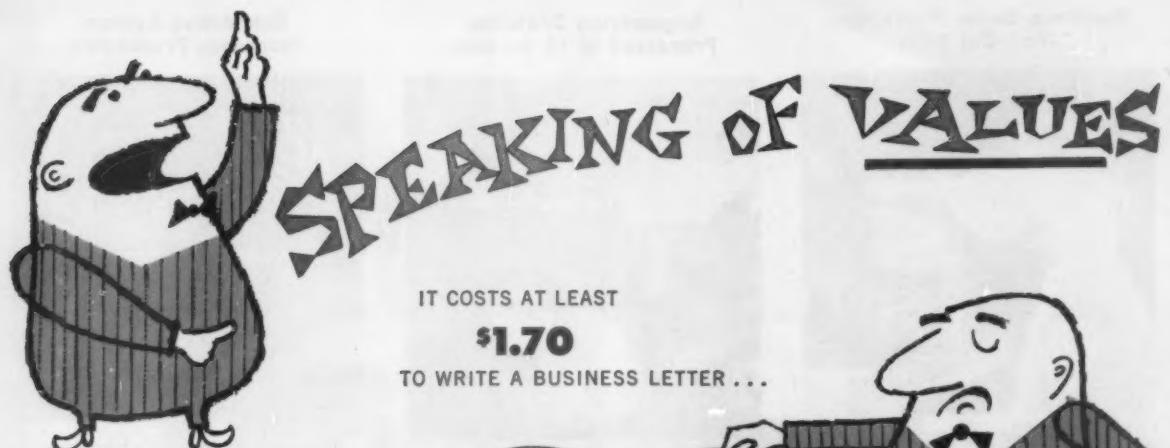
**WRITE NO. 611 ON INQUIRY CARD—PAGE 34**



### High-Speed Copying Saves \$9000 And Cuts Labor in Half

A leading midwestern distributor, Berry Bearing Company, has cut its order-processing costs by almost \$9000 a year. The savings were achieved through the use of high-speed copying equipment. The number of employees required for this operation has been cut from four to two and the average time consumed in preparing each invoice has been reduced drastically. The equipment is supplied by Charles Bruning Company, Inc.

**WRITE NO. 612 ON INQUIRY CARD—PAGE 34**



IT COSTS AT LEAST  
**\$1.70**

TO WRITE A BUSINESS LETTER ...



THE VERY MOST ... THE VERY  
HIGHEST GRADE ... 100% COTTON FIBRE BOND  
PAPER ADDS TO THAT COST IS  
LESS THAN **1¢** ...

... AND  
**WHAT A DIFFERENCE**  
IN  
**IMPRESSION!**



Gilbert quality bond papers are available in 25%, 50%, 75%, and 100% new cotton fibre content grades. They are available in the new Hi-Fi white, as well as a wide variety of colors. Ask your printing supplier or local Gilbert Paper Merchant for samples of letterheads printed on Gilbert new cotton fibre papers and see the difference. **GILBERT PAPER COMPANY • MENASHA, WISCONSIN**



**Purchase Order Processing  
Time Cut 87%**



A west coast firm, Vinson Manufacturing Company issues about 750 purchase orders and 1000 receiving orders monthly. The installation of an A. B. Dick Azograph system provides for the receiving paperwork for materials and parts at the time a purchase order is issued and enabled the company to reduce the clerical time by 87%. The exact copy of the purchase order is handled, thus assuring greater accuracy and legibility.

Write No. 754 on Inquiry Card—Page 34

**Engineering Drawings  
Processed in 10 Seconds**



Retrieval of engineering drawings on microfilm is being speeded, and working prints are now made more readily available since installation of a new microfilm reader-printer at the U. S. Army Ordnance Missile Command, Redstone Arsenal. The Minnesota Mining and Manufacturing unit being used is completely automatic and processes a finished copy in less than 10 seconds.

Write No. 755 on Inquiry Card—Page 34

**Scheduling System  
Increases Production**



Through the use of chart boards supplied by Remington Rand Division of Sperry Rand Corp., the Loard Manufacturing Company, Erie, Pa. has a constantly visible record of machine loading. Every job falling behind schedule is pin-pointed; customer service is improved. The system has brought a substantial decrease in the number of machine setups, and labor requirements can be projected for as much as 20 weeks ahead.

Write No. 756 on Inquiry Card—Page 34

**F R E E**  
*to metalworking management!*

**NEW**  
*16-page illustrated booklet*

**Vapor-from-paper  
STOPS RUST**

Now, you can "mothball" your metal parts or products as easily as your wife protects her woolens. This new booklet tells how Ludlow VPI® Wrap cuts costs in shipping and storage. Read how other companies have saved by modernizing their preservation methods. It's FREE! Ludlow Papers, Needham Heights, Mass. Dept. 166.



For More Information Write No. 614 on Inquiry Card—Page 34

**Make paper handling  
easier and safer**



**Get ADVANCO  
punchless paper holders**

No holes to punch—no holes to tear. Easily insert or remove sheets. Your papers are in order, safe—the Advanco clip bulldog-grips 1 to 150 sheets. Only 2 parts—lasts indefinitely.

*Ask your stationer!*  
If he doesn't carry Advanco, write us  
NOW for name of dealer nearest you.

**ADVANCO**  
MADE IN U.S.A. REG. U.S. PATENT OFFICE

**ADVANCO PRODUCTS, INC.**

76-05 51st Avenue, Elmhurst 73, N. Y.  
For More Information Write No. 615  
on Inquiry Card—Page 34



**ONLY  
29¢**

each

(Medium Point Pen, Fed. Tax incl.)

• BLUE • BLACK • RED • GREEN

Also available:

Fine Point Pen—39c

Reproducing Pen—39c

(10c extra with cap and clip)

**No Other  
Office Pen Has  
Dared to Make**

**E**AGLE  
Finest  
Quality  
Office Pen  
You Can Buy.

*Every EAGLE STICKPEN  
is individually tested  
BY HAND!*



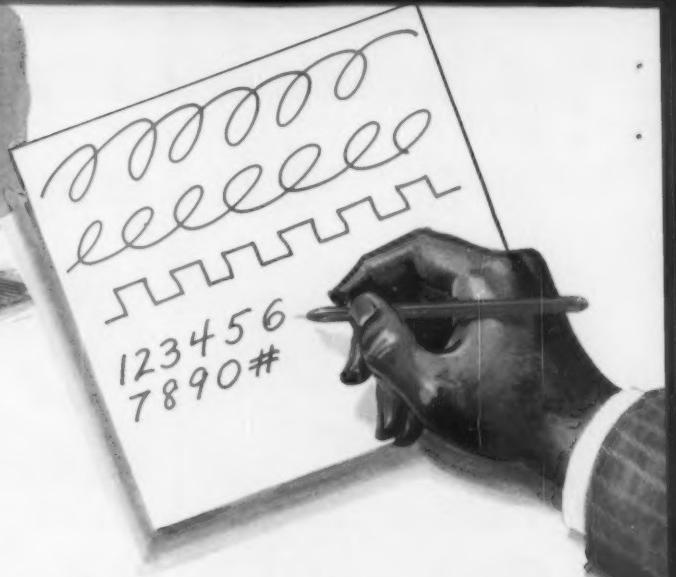
Dared to Make  
This  
Challenging  
Offer!

*See Amazing Free Offer Inside!*



After passing 10 rigid "quality control" laboratory tests, **every** Eagle Stickpen must pass a specially devised **writing** test (see illustration). This test shows up even the slightest imperfection under **actual writing conditions**.

100% of every production run of new Eagle Stickpens is checked out this painstaking way. Just one more reason why the new Eagle Stickpen makes every other office pen a relic!



**But...the *best* test  
is still *in your  
own hand!***

So, fill out and mail the attached coupon (before July 31, 1960) for a FREE EAGLE STICKPEN plus any competitive brand office pen you select!

*EAGLE OFFERS YOU*  
**FREE...**

**NEW**  
**EAGLE STICKPE**

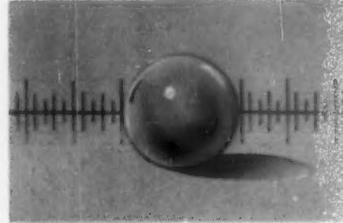
**ONLY  
29¢**

*Only EAGLE dares to make this challenging  
FREE OFFER, because—AFTER 5 YEARS OF LABORATORY  
RESEARCH—The NEW EAGLE STICKPEN sets a NEW  
STANDARD in the Ball Pen Industry!*

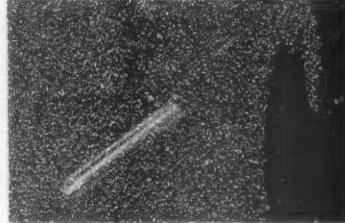
**EAGLE** ...PLUS any competitive brand  
office pen **YOU SELECT!**

**NEW**  
**EAGLE STICKPEN**

COMPARE THE NEW **EAGLE STICKPEN** TO



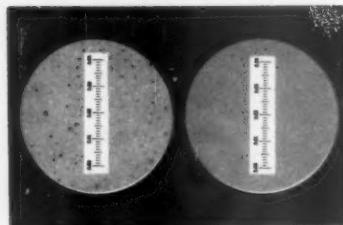
**STAINLESS STEEL BALL**—precisely dimensioned for each ink color and point style—assures accurate ink flow, without bleeding, regardless of the difference in each ink's viscosity. Write medium or fine, in blue, black, red or green. Your new Eagle Stickpen will lay down its ink more smoothly . . . more evenly than any other office pen.



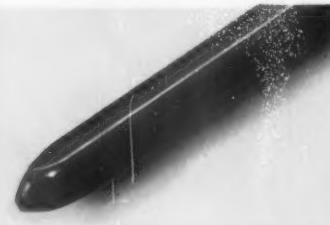
**SILVERED TIP**—machined from solid brass rod stock—is electrolytically (not chemically) plated before ball is inserted. This cushions the ball for smoothest rotation with minimum pressure. You can feel this cushion the moment you touch the new Eagle Stickpen to paper. This silvered cushion lasts the life of the pen.



**PRECISION TURNED**—deliberately provides 8/1000 of an inch clearance for the tolerance—one-fifth the thickness of a hair)—guarantees that the new Eagle Stickpen will never "wobble" when you write scraggly lines of uneven thickness.



**FINEST INK MADE**—contains no particles larger than one micron in diameter. Ordinary inks compared under the microscope showed particles that exceeded 10 microns. No wonder most office pens skip, stall and goop! You can be sure the new Eagle Stickpen won't.



**UNBREAKABLE MOLDED BARREL**—made of costliest, high impact Forticel—will never crack, warp, craze or change color. The new Eagle Stickpen will stand more abuse. And it looks more expensive than ordinary office pens.



**SCIENTIFIC COMFORT**—designed to fit every hand. You can hold the new Eagle Stickpen more comfortably . . . write more easily . . . write more smoothly . . . write more evenly . . . write more evenly than any other office pen.

PRINTED IN U. S. A.

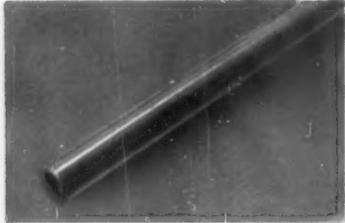
(The new Eagle Stickpen surpasses government specifications on all three counts.)

**STANDARD in the Ball Pen Industry!**

**EAGLE**

*...PLUS any competitive brand  
office pen YOU SELECT!*

TO YOUR PRESENT PEN or to any competitive office pen you select!



**ED BALL SOCKET**  
less 8 to 11 millionths of  
the ball to ride in. This  
the diameter of a human  
at the ball of an Eagle  
wobble" in its socket or  
of uneven thickness.

**NON-CORROSIVE BRASS CARTRIDGE**  
—electronically fused to the silvered tip occu-  
pies the full length of the big 6½" barrel—  
holds an amazing 72 milliliters of ink. This  
means the new Eagle Stickpen will write  
longer.



**COMFORT GRIP**—sculp-  
and more perfectly than  
You'll write longer . . .  
with less finger fatigue,  
the new Eagle Stickpen.

**LONGER SHELF LIFE**—assures instant  
starts even after prolonged inactivity in the  
desk drawer during vacations. The new Eagle  
Stickpen will write the moment you touch it  
to paper.

all these points.)

## *Check It Out*

against any other office pen on every point illustrated and  
described at the left.

## *Feel In Your Own Hand*

the new Eagle standard of writing performance that makes  
every other office pen a relic!

- *Scientific Comfort Grip!*
- *Silvered Tip for Cushioned Writing!*
- *Each Pen Individually Test Written by Hand!*



**EAGLE PENCIL COMPANY**

HEADQUARTERS: Danbury, Connecticut

New York • London • Toronto • Mexico • Sydney • Bogota



**100% Automatic Writing  
Of Business Forms**



A Minneapolis company, Kekket X-Ray Sales Corp., is using a Friden Flexowriter Programmatic to prepare invoices automatically. At the same time a by-product, punch-coded tape is produced which will perpetuate data to subsequently produce a daily invoice journal 100% automatically. The one machine is also used for writing statements, letters to employees, inventory records and labels.

Write No. 752 on Inquiry Card—Page 34

**Visible Records Reduces  
Inventory Investment 40%**



At Owens-Corning Fiberglas Corp. a specially designed Kardex record enables the classification of all items according to sales volume, and the assignment of turnover rates and reorder limits to each classification. In addition to a 40% reduction in inventory investment, the system increased turnover almost five times a year. The method was planned by Remington Rand.

Write No. 753 on Inquiry Card—Page 34

For More Information about ad on facing  
←page Write No. 600 on Inquiry Card—pg. 34  
MAY 23, 1960



**Copyflex One-Writing System Slashes  
Receiving Report Preparation up to 80%!**

One writing or typing of information does it for purchasing-receiving paperwork when you use Copyflex copying machines!

With Copyflex, the purchase order is typed on a multiple-part form, and a reproducible copy sent to Receiving. Receiving information is added directly to this copy—extra columns provide for multiple receipts. Each time receiving data is entered, any number of Copyflex copies (white or color coded) can be made.

That's it! No preparation of separate receiving report forms. No rewriting or retyping of purchasing information. You speed flow of goods, slash clerical writing up to 80%.

Copyflex is best for systematized paperwork because it's flexible and economical—letter-size copies cost less than a penny each for materials. Why not put yourself on the receiving end of important savings by mailing the coupon, right now!

**BRUNING**  
*Copyflex*

**Charles Bruning Company, Inc., Dept. 1-S-R  
1800 Central Road, Mount Prospect, Ill.  
Offices in Principal U. S. Cities  
In Canada: 103 Church St., Toronto 1, Ont.**

Please send me more information on Copyflex for Purchasing-Receiving.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_

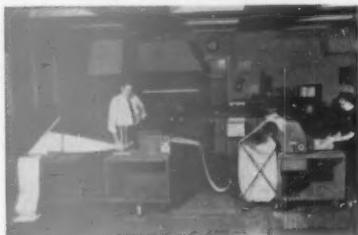
For More Information Write No. 601 on Inquiry Card—Page 34

### New Forms System Cuts Costs \$30,000 A Year

Clarostat Mfg. Co., Inc., Dover, N.H., installed an automated procedure for processing a heavy volume of industrial and distributor orders. Moore business forms were used in the new system. In addition to the reduction of time, labor, and errors as a result of the one-writing operation, the system provided more accurate, less costly stock control and more comprehensive analyses reports with an annual savings of \$30,000.

Write No. 757 on Inquiry Card—Page 34

### \$160,000 Annual Savings At Detroit Edison



Utility billing at the Detroit

Edison Company, serving more than one million customers, is handled by a data processing system, using an electronic computer and high-speed printers. It results in a savings of several days in processing time. Approximately \$160,000 a year and one day's time is saved through the use of a Thermobond Unit, designed by The Standard Register Company. This machine converts continuous forms, printed on one side, into postcard bills with printing on both sides.

Write No. 758 on Inquiry Card—Page 34

### Recording System Saves Timekeeping Costs

Installation of a central timekeeping system, with automatic recording of time and job data, has enabled Midland-Ross Corp. to cut timekeeping costs \$15,000 annually. Equipment consists of 25 reporting stations, four Dictaphone recorders, a transcriber and a Dictachron time announcer. At completion of a job, the worker picks up handset, the time is



announced, and he dictates his job-time report. Data is transferred to key punched cards for payroll and processing.

Write No. 759 on Inquiry Card—Page 34

### Label Printing Machine Breaks Bottleneck

A label-making system installed at Appleton Electric Co. has solved a difficult order-handling problem. The solution: One punch card is pulled for each item ordered. It goes to warehouse; shipping papers to shipping office. A

(Please turn to page 468)

### IF YOU USE CARBON RIBBONS

SWITCH TO



FOR FINEST REPRODUCTION RESULTS

- DISTINCTIVE EXECUTIVE CORRESPONDENCE
- ORIGINALS FOR OFFSET DUPLICATING MASTERS
- XEROX COPY
- COPYING WORK ON ALL WET OR DRY COPYING EQUIPMENT



Beautiful sharp, black, opaque reproduction of typing and an extensive variety of copies. Exceptional results, because of M.PR's thin, no-break, no-tear, extra long \*MYLAR plastic film, inked with an exclusive Old Town formula.

TEST DEMONSTRATION. Write us on your letterhead for details. State your requirements and type of machine or machines involved.

\*Reg. T. M. E. I. DuPont Co.

OLD TOWN CORPORATION

Established 1917

750 Pacific Street, Brooklyn 38, N.Y.

World's Foremost Makers of Carbons,  
Ribbons, Duplicators and Duplicator Supplies

For More Information Write No. 617 on Inquiry Card—Page 34

466

### How to Get Your Name on the Mailing List

and receive your own personal copies of PURCHASING as soon as issued!

Why wait to see pass-along copies when it is so easy to have your own subscription? You can read PURCHASING at your own leisure . . . and build a valuable idea file of helpful articles, or save the entire magazine.

The know-how you accumulate this way will be returned many times over by making your work easier . . . and more profitable.

Mail this Coupon TODAY

Subscription Manager, PURCHASING  
205 E. 42nd St., New York 17, N.Y.

Send me PURCHASING every-other-week, as fast as issued, at your bargain rate of only \$4 for the 26 copies.

Payment enclosed

Send bill later

Name ..... Title .....

Company ..... Principal Product .....

Address ..... State .....

City & Zone ..... State .....

Send Purchasing to my home address:—

PURCHASING



## Everything's perfectly clear—they're Verifax copies!

Verifax copies are dry, white, easy-to-read . . . accurate in every detail. They won't fade or darken . . . will last as long as typed records. And they're as easy to handle, file or mail. All of which is mighty important in business.

See how you can make 5 of these dry, more usable copies in 1 minute for 2½¢ each with Kodak's \$99.50 Verifax Bantam Copier, which outperforms other makes of copiers costing up to 4 times as much!

Phone local Verifax dealer (see Yellow Pages under duplicating or photocopying machines), or write Eastman Kodak Company, Business Photo Methods Division, Rochester 4, N.Y. Prices quoted are manufacturer's suggested prices and subject to change without notice



**Verifax Copying** DOES MORE . . . COSTS LESS . . . MISSES NOTHING

MAY 23, 1960

For More Information Write No. 618 on Inquiry Card—Page 34

(Continued from page 466)

die-cut stencil is prepared from the information in the papers and sent to dispatcher's office. There, a Weber Addressing Machine is



used to print as many labels as necessary. The system is timed so that labels are run off to coincide with receipt of material from warehouse.

Write No. 760 on Inquiry Card—Page 34

#### Automated Offset System Saves \$30,000 Annually

An integrated data processing system which handles internal or-

der-invoice paperwork for more than 30,000 products in 145 departments is now yielding an annual saving of \$30,000. Under the new procedure a single typing creates an offset master which, when run on the A. B. Dick auto-



mated offset duplicator, produces all order paperwork. The system has increased production speed and eliminated retyping and proofreading of back orders.

Write No. 761 on Inquiry Card—Page 34

#### Electronic Inventory Increases Turnover



An electronic inventory system which monitors more than 25,000 items, prepares 8000 invoices per week and reorders items which fall below minimum stock levels is achieved at Bergen Drug Co., Hackensack, N. J. with an IBM Ramac 305. The system has increased inventory turnover from 10 to 12 times a year, and reduced the number of items ordered but unavailable from 3% to less than 1/10 of 1%.

Write No. 762 on Inquiry Card—Page 34

"Heard the news? **HURON COPYSETTE**  
costs less than ever before."

**Huron Copysette**  
PULL OUT SET

**MANIFOLD CARBON PAPER SETS**

Yes, despite increases in paper work cost, **HURON COPYSETTE**, patented manifold carbon paper set, costs less than ever before.

1. **HURON COPYSETTE** saves typing time — up to ½ hour per day for each typist employed.
2. **HURON COPYSETTE** saves money — it actually costs less than carbon and second sheets bought separately.
3. **HURON COPYSETTE** reduces inventory cost — eliminates overlapping inventories of carbon paper and second sheets. One weight and finish of carbon — attached to its own second sheet — gives you one item to stock.
4. **HURON COPYSETTE** makes legible — smudge free copies.
5. **HURON COPYSETTE** is easy to use — count the number of carbon copies to be made — align with original — and type. For more information write for free samples and brochure.

Available in Canada through APSCO PRODUCTS, LTD., Toronto, Canada  
\*Licensed under Kerr Patent No. 2,557,875  
(Address inquiries to Dept. M.)

**FORT HURON SULPHITE & PAPER CO.**

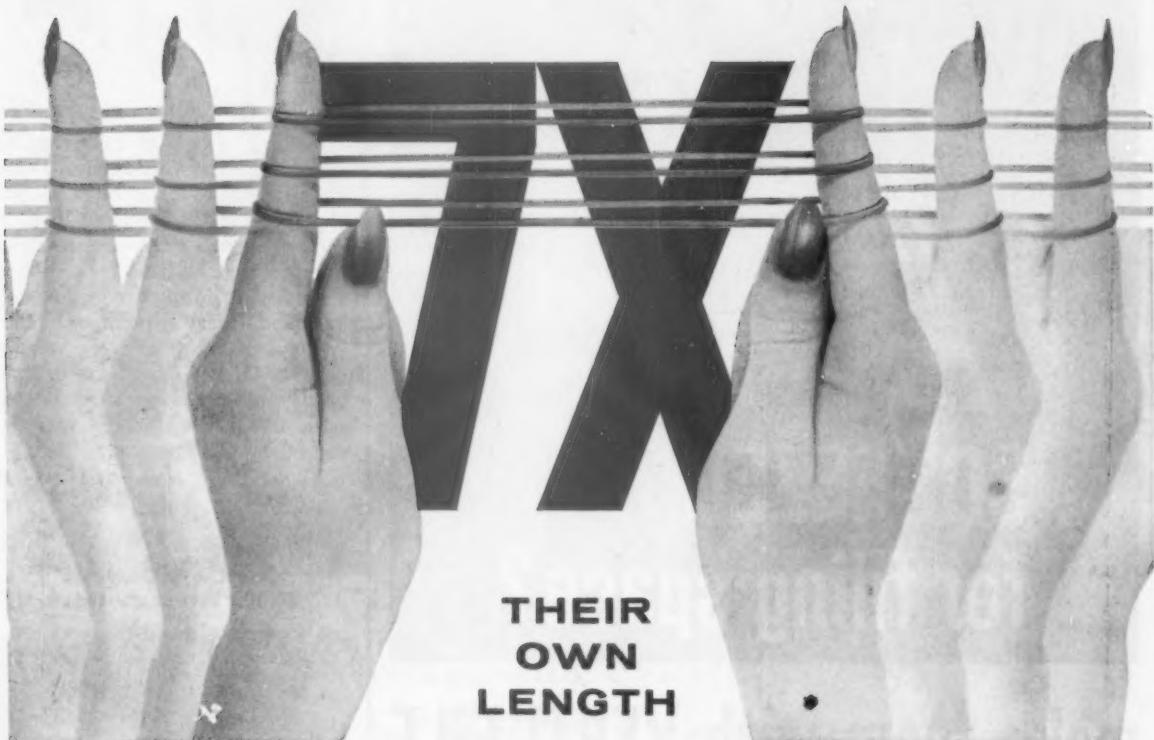
For More Information Write No. 619 on Inquiry Card—Page 34

For a  
Complete Report  
on the  
45th Annual  
N.A.P.A. Convention  
Don't miss  
the  
June 20th Issue  
of  
**PURCHASING**  
Magazine

GUARANTEED BY

EBERHARD FABER

# STAR BANDS STRETCH



THEIR  
OWN  
LENGTH

STAR RUBBER BANDS ARE MADE BY EBERHARD FABER TO SNAP BACK AGAIN AND AGAIN!

Just another rubber band?

Not at all! STAR RUBBER BANDS are made only of pure rubber to live longer, stretch longer...to be used over and over. Grey or colored, every STAR rubber band in the package is carefully cut for uniform dependability. EBERHARD FABER has been making quality rubber bands for almost a century!

Your nearest stationer is the man to see for STAR rubber bands by EBERHARD FABER—your one source of supply for all writing needs.



SINCE 1849

**EBERHARD FABER**  
*puts its Quality in writing*

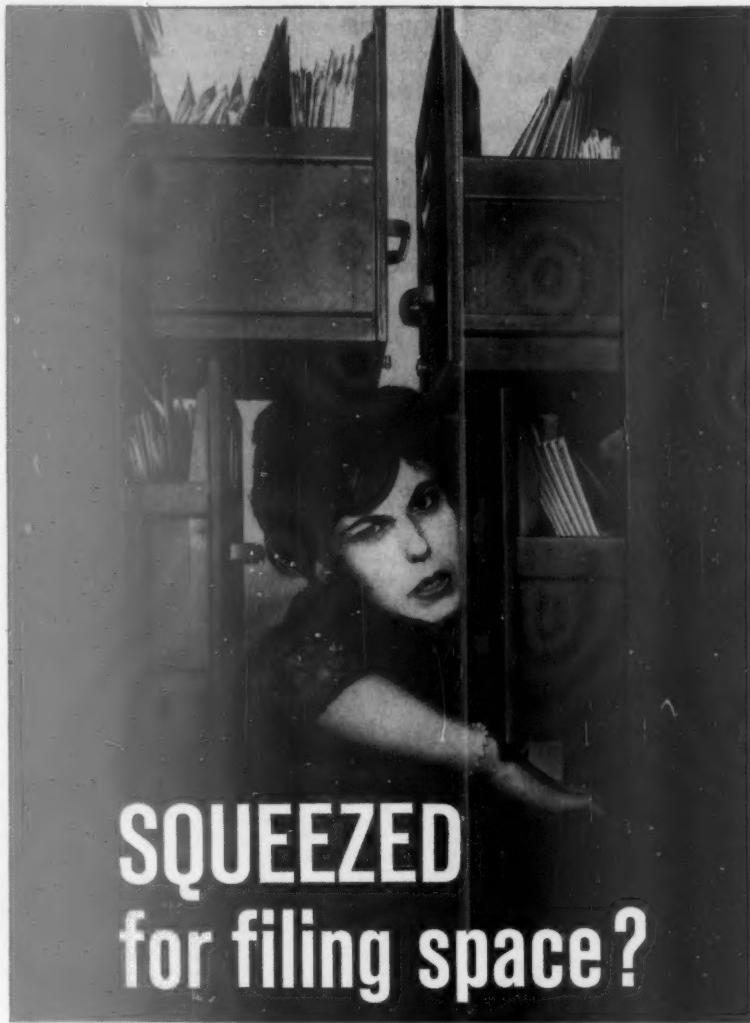
© 1960 Eberhard Faber Inc.  
Tm. Reg. U.S. Pat. Off. and Other Countries

Wilkes-Barre, Pennsylvania-New York-Toronto, Canada

MAY 23, 1960

For More Information Write No. 620 on Inquiry Card—Page 34

469



## SQUEEZED for filing space?

# make room with VERTI-FILE

With VERTI-FILE you can file over twice as much material in the same floor area occupied by a conventional file. VERTI-FILE makes more room! That's why more and more offices are switching to this modern system for filing active records.

Compared with the regular 4-drawer file which holds only 8% lineal feet of active records, an 8-shelf VERTI-FILE unit provides space for 23½ lineal feet. Further, VERTI-FILE positions filed material so you can get at it faster and easier than ever.

Get out of that squeeze . . . get VERTI-FILE! Call your local Deluxe dealer, or write direct to Deluxe Metal Products Co., Warren, Pa.



*Royal* METAL MANUFACTURING COMPANY  
**DELUXE** METAL PRODUCTS CO. DIVISION  
WARREN • PENNSYLVANIA

For More Information Write No. 621 on Inquiry Card—Page 34

### 3500 Man-Hours Saved With Follow-Up Procedure



A card system of following up purchase orders installed at Texas Instruments, Inc., has helped them lighten the routine load on buyers, reduced the possibility of overlooking delivery dates, and virtually eliminated the possibility of a delivery entering the plant without being inspected and recorded. A saving of more than 3500 man-hours was achieved with this system which was designed by VISIrecord.

Write No. 763 on Inquiry Card—Page 34

### One Clerk Controls 20,000 Inventory Items



Arma Division of American Bosch, Garden City, N. Y. uses one clerk to control 20,000 laboratory and test instruments. It is possible to determine where the instrument is and when it is due back for re-certification. A VISIrecord Capacifile houses all the cards in a minimum floor space. Scanning all 20,000 records takes only about one hour.

Write No. 764 on Inquiry Card—Page 34



A NATIONAL SYSTEM repaid its cost in ten months.

ARNOLD J. ROMEYN, SECRETARY-TREASURER of Kit Manufacturing Co., Inc.



MODERN EXTERIOR of a Kit Stateliner Mobile Home.

## "Our *National* Accounting System saves us \$8,600 annually... pays for itself every 10 months."

—Kit Manufacturing Co., Inc.,  
Long Beach, Calif.

"This year Americans will invest over a billion dollars in mobile homes. To keep astride with this giant market requires the most modern accounting techniques. That's why we have installed a National Accounting System," writes Arnold J. Romeyn, Secretary-Treasurer of Kit Manufacturing Co., Inc.

"We find the speed, accuracy, and efficiency of our National System frees departmental personnel for other important tasks. Even our most complex accounting demands are handled swiftly and precisely by Nationals. For example, our National Accounting System handles general ledger, payroll,

accounts receivable, purchases, distribution, and a host of other record keeping requirements.

"To conclude, we feel that Nationals have certainly helped us maintain our position as the West's largest producer of mobile homes. Most important, our National Accounting System saves us \$8600 annually... pays for itself every 10 months."

Your business, too, can benefit from the many time- and money-saving features of a National System. Nationals pay for themselves quickly through savings, then continue to return a regular yearly profit. National's world-wide service organization will protect this profit. Ask us about the National Maintenance Plan. (See the Yellow Pages of your phone book.)



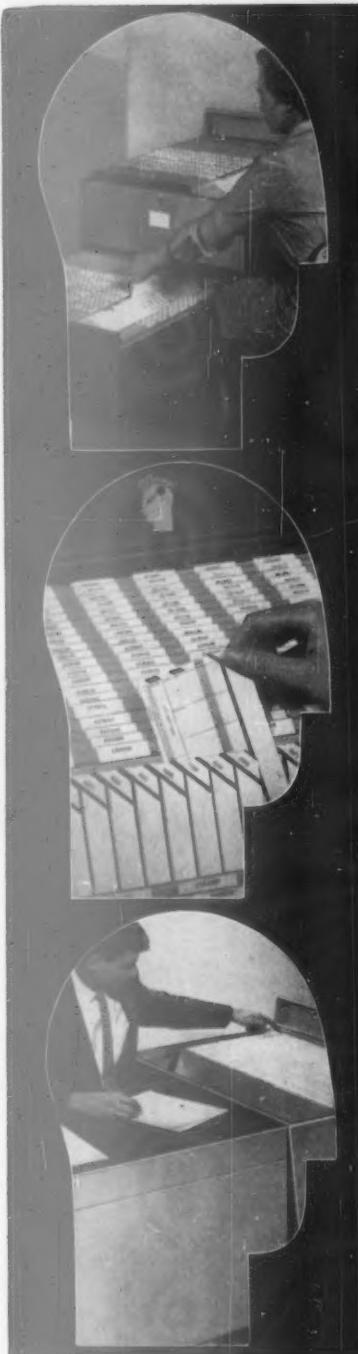
*AJ Romeyn*

Secretary-Treasurer of  
Kit Manufacturing Co., Inc.

**THE NATIONAL CASH REGISTER COMPANY, Dayton 9, Ohio**  
1039 OFFICES IN 121 COUNTRIES • 76 YEARS OF HELPING BUSINESS SAVE MONEY

\*TRADE MARK REG. U. S. PAT. OFF.  
**National**\*  
ACCOUNTING MACHINES  
ADDING MACHINES • CASH REGISTERS  
NCR PAPER (NO CARBON REQUIRED)

For More Information Write No. 622 on Inquiry Card—Page 34



## here's how **VISIrecord**

*split-second record location*

...at

### **KELLOGG CO.**

accelerated processing 33%...

One VISIrecord system now handles the scheduling and controlling of preventive maintenance for 96 departments. Processing of requisitions was accelerated at least 33%.

...at

### **J. W. ROBINSON, CO.**

reduced inventory time  
248 man hours...

The VISIrecord furniture unit control system also helped increase turnover from 2.8 to 3.5, reduced merchandise return by 10% and cut delivery time.

...for the

### **WEATHERHEAD COMPANY**

saved over \$40,000 the first year...

A VISIrecord system provides finger tip access to accurate records of carriers and routes for shipments to any part of the country. The traffic manager and one clerk check all shipments, picking the most economical carrier.

*The world's fastest visible record keeping system*

## ...can help you

VISIrecord Systems Specialists have the know-how to analyze your record-keeping set-up. Their experience and the facilities available to them will enable them to provide you with a time and money-saving system. Write to Dept. P-3 for case histories on above and any other applications.



### **VISIrecord, Inc.**

375 PARK AVENUE, NEW YORK 22, NEW YORK

SYSTEMS SPECIALISTS IN PRINCIPAL CITIES

For More Information Write No. 623 on Inquiry Card—Page 34

## Tool Crib Control Brings Major Savings



Kooima Machines Works, Inc., Rock Valley, Iowa, has obtained greater tool utilization through the use of a simple method of tool crib control. System fixes responsibility for each tool with a three-part form filled out by employee when he checks out tool. One copy goes in empty tool space, second goes in employee file, the third is kept by employee. The Kollect-A-Matic system, supplied by Remington Rand, has enabled the company to cut taking tool inventories from four times to once per year.

Write No. 796 on Inquiry Card—Page 34

## Sales up 100 to 300% Through Forms Change



A sales increase of up to 300% is the result of a change in order forms the Hambro Automotive Co., Ridgefield, N.J., supplies to its dealers. By combining catalog, price list, and order form into one pad of 25 four-part Zipsets, designed by the Standard Register Co., the parts supplier has made dealer ordering quick and simple. To order parts, dealer writes quantities needed opposite pre-

printed descriptions on the forms. Over 1000 items are listed. Dealer keeps one copy of set, mails complete pad of remaining copies to get his order filled.

Write No. 797 on Inquiry Card—Page 34

#### Integrated Paperwork Cuts Inventory 50%



A new method of distribution, with equipment stocks concentrated in five warehouses, has enabled the Systems Planning Division of the Underwood Corp. to cut inventories 50% while providing faster deliveries to its customers. Control is achieved by using an A.B. Dick Azograph duplicated paperwork system. Only one writing of basic information produces all documents needed to pick, ship, initiate billing, and record the transaction.

Write No. 798 on Inquiry Card—Page 34

#### Shelf Filing Doubles Capacity, Adds Space

Doubled efficiency in filing is keeping Exploration and Production field crews of Shell Oil Co. better informed at lower cost. A shelf filing installation has doubled filing capacity while using 40% less floor space. The new space-finder equipment, manufactured by the Tab Products Co., was installed at half the cost of drawer cabinets. In the space saved, inactive files were moved from another floor providing more rapid access to them. Shell estimates that efficiency is increased by 50%. Where a girl working in one section of a drawer cabinet ties up the entire file cabinet, in the shelf system clerks are able to work side-by-side. More files are concentrated in a given space and file doors can be used as working shelf.

Write No. 799 on Inquiry Card—Page 34

Here are two standing invitations. First, visit the show room of your nearby, authorized Peerless Dealer. See how modern, functional office furniture can improve your business operations.

## Be seated, gentlemen . . .

Secondly, accept his invitation to "Be seated, gentlemen . . ." Take the driver's seat of this (and many more) Peerless Modulette grouping. Experience first hand how Peerless Modular furniture offers you more work efficiency than you've ever experienced.

Here's a good start—ask for a copy of Peerless Modular Catalog No. 144.



# Peerless

stylized office furniture

New York  
Chicago  
Houston  
Seattle  
Los Angeles

PEERLESS STEEL EQUIPMENT COMPANY  
Unruh & Hasbrook Aves.  
Philadelphia 11, Penna.

For More Information Write No. 624 on Inquiry Card—Page 34

# Slash costly down time ... boost production with **Lincoln LUBRICATION SYSTEMS**

WHEREVER WHEELS TURN...wherever it is necessary to maintain a film of lubricant on bearing surfaces...there is an application for Lincoln Lubricating Systems and Devices. From automated production lines to the simplest machinery...designed for a new installation or existing equipment...there is a Lincoln Lubricant System to meet your particular needs.

SPECIFY LINCOLN and you choose from the most complete line on the market. A half-century of engineering "know-how" stands behind every Lincoln product.



#### POWER-OPERATED DRUM PUMPS

(for original 120-lb. or 400-lb. drums)—Complete selection of air motors and pump tubes...all popular pressure ratios.



#### HOSE REELS

(for grease, oil, air and water services)—Heavy duty, spring-actuated.



#### MATERIALS DISPENSING SYSTEMS

(power-operated for pole, spray or flo gun applications)—Complete systems for original 400-lb. drums or 5-gal. packages.

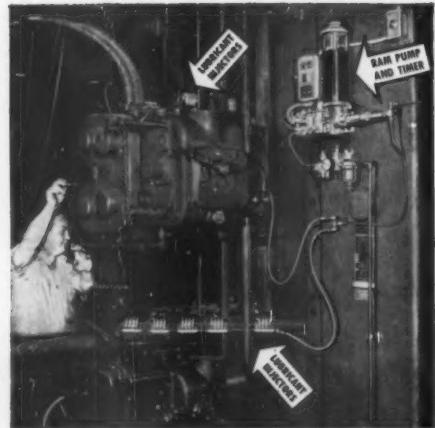


#### PORTABLE POWER LUBRIGUNS\*

(electric or air-operated)—Lube capacities from 30 lbs. to 60 lbs.

\*Reg. U.S. Pat. Off.

*Let us show you how PRODUCTIVE lubrication maintenance can cut YOUR costs*



ESSENTIAL WEAPON in the war on wear: a Lincoln Centralized Lubrication System that is completely automatic... applying lubricant under high pressure to all bearings in seconds, simultaneously, on production machines at pre-set time intervals. Over 30 different systems available to meet all industrial applications.



**Lincoln**

Coast-to-Coast Sales and Service Through 16  
Branch Offices and Leading Industrial Distributors

For More Information Write No. 625 on Inquiry Card—Page 34



V

**MRO and  
Safety Supplies**

A

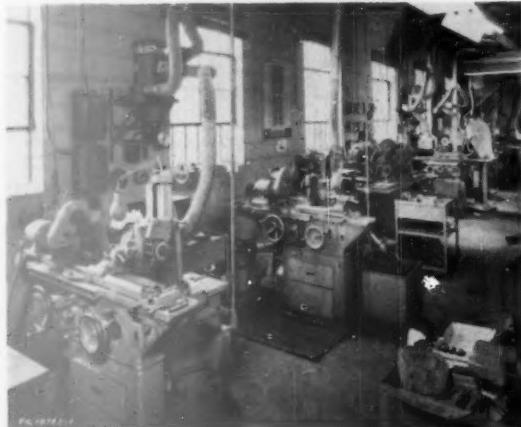
## MRO and Safety Supplies



### Spray-On Multicolored Paint Is Tough, Repels Dust and Dirt

The Hoffman-La Roche plant in Nutley, New Jersey, began to paint with Plexitone seven years ago, already has one million sq. ft. of wall space painted with it, and plans more for the future. Two or more colors can be sprayed in single coat, creating interlacing color network. Plexitone can be scrubbed with soap and water, or even harsh abrasives. Tough to scratch, practically odorless paint hides minor defects, and anti-static properties repel dirt and dust.

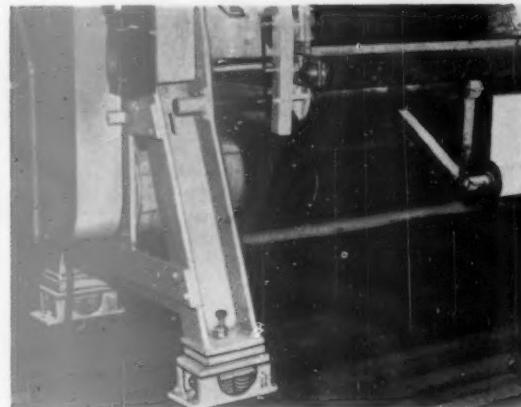
**WRITE NO. 626 ON INQUIRY CARD—PAGE 34**



### Carbide Tool Maker Saves 20% With Diamond Salvage Program

The Tungsten Carbide Tool Co. of Detroit estimates its diamond salvage program saves nearly 20% of the value of diamond wheels used. Recently installed Torit Diamond Collectors operated on centrifugal separating principle which eliminates filters entirely and permits low-cost design. Price of unit is no more than single diamond wheel, and savings of up to \$200 for every \$1000 invested in diamond wheels can be anticipated.

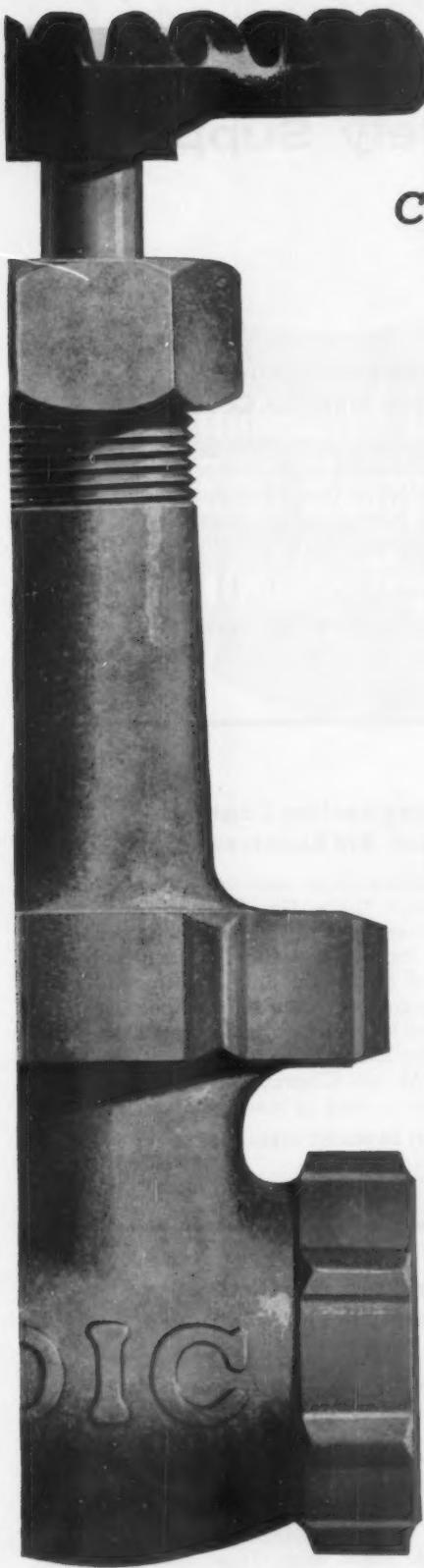
**WRITE NO. 627 ON INQUIRY CARD—PAGE 34**



### Machine Mounts Stop Vibration, Cut Noise in Textile Plant

Four tufting machines were causing a serious vibration and noise problem at Cabin Crafts, Inc., a Georgia manufacturer of textile goods. Machines which were installed on an upper wooden floor caused so much vibration and clatter that there was danger of damage and efficiency of personnel was impaired. After several makes of pad type "vibration absorbers" failed, steel spring isolation with Korfund Vibro-Isolators solved the problem with complete satisfaction.

**WRITE NO. 628 ON INQUIRY CARD—PAGE 34**



**CHECK OIC FIRST...IT PAYS!**

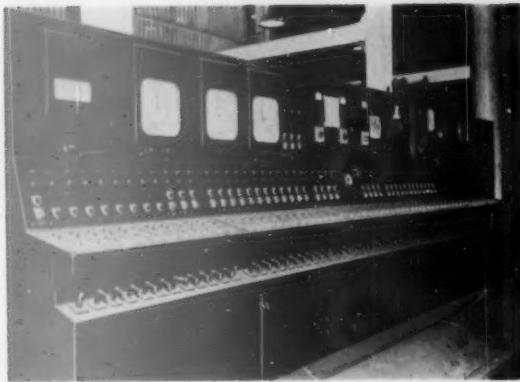
**SERVICE** to meet your valve needs is the "specialty of the house" at your nearby OIC Valve Distributor. As a first-line distributor, he gets OIC's all-out support to insure that you get the service you deserve. OIC's strategically located warehouses, and complete-line factory inventory "backstop" every OIC distributor with a multi-million dollar stock of bronze, iron, ductile iron, cast and forged steel valves. As a result of this strong distributor support, immediate delivery of the more popular items out of distributor's stock is common, and 4 to 5-day delivery out of warehouse or factory stock is routine. When quality is a problem, or delivery is urgent, phone your OIC distributor. Service is his business, and ours.



THE OHIO INJECTOR COMPANY • WADSWORTH, OHIO

FORGED AND CAST STEEL, BRONZE,  
IRON AND DUCTILE IRON VALVES

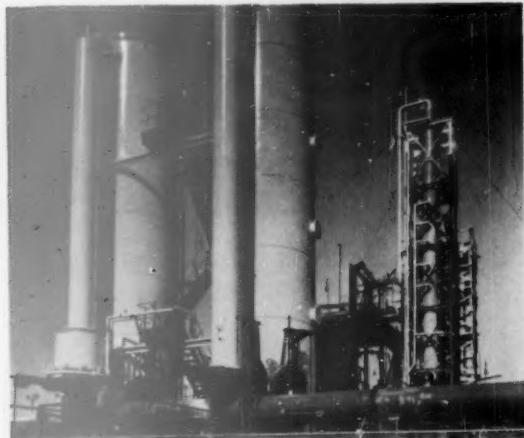
## MRO and Safety Supplies



### Centralized Lubrication Saves Labor and Material Costs

The Hanna Coal Co. saves \$32,240 per year in labor alone with Lincoln centralized lubrication systems installed at their Georgetown, Ohio, preparation plant. Central panel controls lubrication function throughout plant. Lubricant costs have been cut 45% since system was installed by Lincoln Engineering Co.

**WRITE NO. 630 ON INQUIRY CARD—PAGE 34**



### Bright, Long-Lasting Coatings Save Labor, Aid Maintenance

To simplify maintenance and add to plant safety, the Brooklyn Union Gas Co. decided to color-code the towers and piping at its light oil plant. Corrosive conditions made it difficult to retain the color of the bright blues, greens and yellows. Urethane coatings were selected because of their resistance to corrosion, color retention, and ease of application. The tough coatings, developed by the Mobay Chemical Co., are expected to last twice as long as other paints.

**WRITE NO. 631 ON INQUIRY CARD—PAGE 34**



### High Pressure Rig Cleans Open Hearth Furnace in Day

A high pressure water pumping rig, designed and assembled by the Worthington Corp., now makes it possible to clean an open hearth furnace in one eight-hour shift at the Great Lakes Steel Corp., Ecorse, Mich. To clean hot brickwork, the company originally used 100 PSI air. A gradual build-up of foreign matter was not removed and required manual cleaning after three months, a job which took eight days. Now, water is sprayed through lances inserted into checker banks without removing any refractory.

**WRITE NO. 632 ON INQUIRY CARD—PAGE 34**

Interested in Saving  
Real Money on  
Trichlorethylene?

## DETREX Customers Save Thousands of Dollars Per Year

Although solvent degreasing is a most economical method of metal cleaning, operational studies often result in trichlorethylene savings of 15%.

Any trichlorethylene degreasing operation which has not been studied recently by an experienced degreasing engineer is a logical candidate for this 15% saving—or even more.

This results from the fact that changes in manufacturing processes, which cause excessive solvent consumption, often go unnoticed.

Our staff of experienced engineers has been making scientific studies of operational efficiency since the beginning of solvent degreasing. They would be most pleased to study your operation. Why not drop us a line today.

Write for your free copy  
of Dr. C. E. Kircher's  
informative paper:  
"Solvent Degreasing—What  
Every User Should Know."

# DETREX

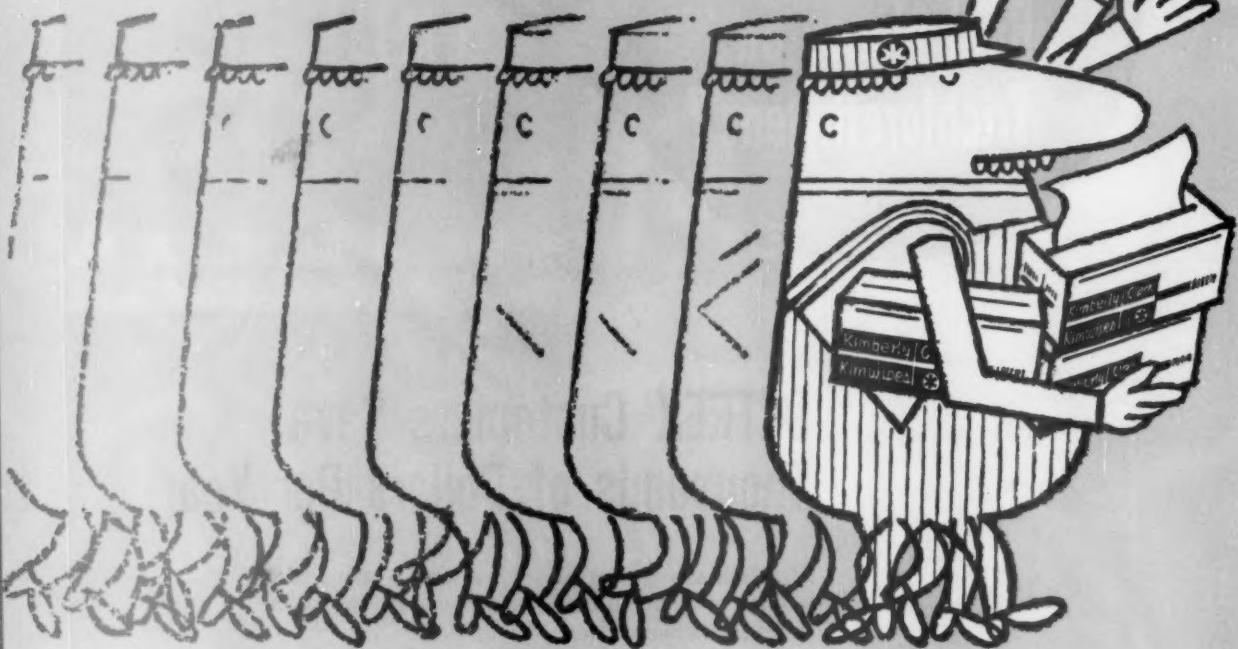
CHEMICAL INDUSTRIES, INC.

Box 501, Dept. P-560, Detroit 32, Michigan

For More Information Write No. 633 on Inquiry Card—Page 34

# Now...try Kimwipes® free!

DISPOSABLE WIPERS



Mail the coupon today so that we can rush you your FREE box of 100 Kimwipes disposable wipers. Prove to yourself how quickly they cut production costs—how they outperform shop towels and rags! Discover how they wipe cleaner, faster, save workers' time.

Check on Kimwipes' excellent pick-up, conformability, superior wet-strength.

Super-sanitary Kimwipes pay for themselves in savings on towel laundering, alone! Available in handy pop-up packages or metal wall dispensers.

Kimberly-Clark Corporation  
Dept. No. P23-50  
Neenah, Wisconsin

Fill in this coupon,  
and mail it, today!

Please send me my FREE package of Kimwipes disposable wipers, Type 1300.

NAME \_\_\_\_\_

FIRM NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

By the makers of KLEENEX tissues . . .

**Kimberly** **Clark**

PRODUCTS



# MRO and Safety Supplies

V  
VALUE ANALYSIS  
A

## Plastic-Coated Work Glove Cuts Glove Costs 84%

For handling oily steel stock and metal parts, one manufacturer had been using canvas gloves that lasted one shift. Today an Edmonton flexible plastic-coated glove with excellent wet grip averages 16 shifts, for a reduction in glove costs from 27 cents per man-shift to only 4-1/3 cents—a saving of 84%. "Snorkel" glove has industrial weight vinyl coating with excellent abrasion resistance, is liquid proof, extremely flexible and has outstanding grip for both wet and dry handling.

Write No. 410 on Inquiry Card—Page 34



## Town Cuts Power Operating Costs with Heat Recovery

The trend to higher fuel costs and larger boilers has induced many municipalities to use waste heat for reducing operating costs. Typical example is Braintree, Mass., which recently installed a package unit from Air Preheater Corp. to preheat combustion air with heat from the stack gases. Factory-assembled preheater requires only ducts for combustion air flow and hot flue gas flow. Savings in fuel costs are expected to pay unit's costs in less than two years.

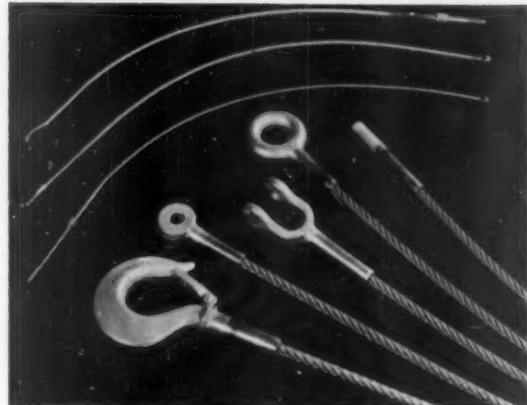
Write No. 411 on Inquiry Card—Page 34



## Pre-fabricated Wire Rope Assemblies Make Home Splicing Unnecessary

Precision-made ready-to-use cable assemblies make in-shop wire rope splicing old-fashioned. In P & H electric hoists the wire is a pre-fabricated Macwhyte rope assembly. It is easy to replace because the correct fittings are permanently attached to the rope. Fittings are swaged on to develop full strength.

Write No. 412 on Inquiry Card—Page 34



For More Information about ad on facing  
←page Write No. 413 on Inquiry Card—pg. 34

CORRECT LUBRICATION IN ACTION...IN AN EMERGENCY!

# FROM DOUBLE DISASTER



Action shown here recalls the 1958 flood disasters in America's largest all-electric steel foundry operated by LFM Company, Atchison, Kansas. This division of Rockwell Manufacturing Company is one of the largest valve manufacturing plants in the world and a leader in steel-casting experimental work.



# Correct

# TO FULL PRODUCTION !

**How Mobil helped LFM Company keep disaster costs to a minimum... return production to normal after two floods within three weeks.**

ATCHISON, KANSAS; JULY 1958:

*It couldn't happen—but it did! A second vicious flood only three weeks after one had ripped through the LFM Company's plant in Atchison, Kansas.*

In both floods Mobil engineers speeded emergency aid, putting in 288 hours of voluntary service, working shoulder to shoulder with LFM personnel on many aspects of the disaster problem.

- Located and sent in portable pumps to flush out contaminated oil reservoirs.
- Trained people to flush, clean and rust-proof machines and parts.
- Prepared tanks for removing rust from corroded

parts—by lining with wax, installing racks and filling with rust-removing acid.

- Obtained dispensing equipment to replace that missing.

As a result of this kind of help, 897 finished worms for motor driven valves were saved and delivered to the customer on time . . . saving LFM \$36,000. In addition, 1705 gallons of oil were identified and reclaimed. Everything possible was done to protect machines and restore normal production.

*This is Mobil Correct Lubrication in Action in an emergency! The remarkable cost-cutting lubrication program that's helping leading industries cut costs and improve profits. Why accept less for your plant?*

## SAVINGS

DURING NORMAL PRODUCTION THROUGH  
CORRECT LUBRICATION IN ACTION!



*Drill tapping speed increased . . . tool life extended 316%. Troublesome radial-drill tapping operation at LFM was studied by Mobil representative. He recommended use of a Mobil cutting fluid. This product increased number of holes tapped between tool changes by 316%. Tapping speed was increased 89%.*



*Storage problem solved—\$11,388 saved. Storage of unmachined castings posed problem for LFM. Outdoor storage was desirable but castings rusted, had to be sandblasted before they could be finished. Mobil recommended rust preventive that eliminated sandblast . . . reduced handling time . . . saved \$11,388.*

MOBIL OIL COMPANY

150 East 42nd Street, New York 17, N. Y.

# Lubrication

For More Information Write No. 414 on Inquiry Card—Page 34

MAY 23, 1960

483

# PLASTIC STEEL® SAVED THIS POWER COMPANY\*

**\$75,000**

## THIS DIESEL GENERATOR

unit was out of action because the wet sleeve cylinder liners and block were badly corroded.

The strongest, toughest,  
most versatile repair  
and tooling material  
available today!

Plastic Steel, THE ORIGINAL EPOXY REPAIR MATERIAL, and other Devcon products are used by steel mills, chemical plants and many other industries for repairing worn parts, salvaging cracked castings, sealing leaking hydraulic systems and tanks — building up worn pumps and valves — altering cams and gears — repair-

Write today for free case histories of how Plastic Steel and other Devcon products have saved time and money on all kinds of plant maintenance jobs. Our laboratory and engineering staff is available to help with your special problems — no obligation, of course.

## DEVCON CORPORATION

61 ENDICOTT STREET, DANVERS, MASS.

A COMPLETE LINE OF QUALITY PRODUCTS FOR  
PERMANENT REPAIRS AND PLASTIC TOOLING.

Order a supply from your local Industrial Distributor today.  
Free catalog and engineering reports available on request.

\*Plastic Steel is the registered trade mark for Devcon Corporation's metallic molding and filling compound.

For More Information Write No. 795 on Inquiry Card—Page 34

## Automatic Filter Plant Pays for Itself



An automatic filter plant installed at the Liebmann Breweries in Brooklyn, N.Y., to clarify city water for bottle wash and process water, will pay for itself in less than a year in reduced labor costs. Two R. P. Adams IWF diatomaceous earth filters with automatically timed cycles deliver "highly polished" water to a 30,000-gallon storage tank with virtually no attention from the operators. The sole manual operation is filling slurry tank with diatomite and water.

Write No. 426 on Inquiry Card—Page 34

## Diaphragm Valves Cut Maintenance in Half



ing fuel and water lines — even under pressure. Approved under Mil. Spec. MIL-C-15202. Bonds iron, steel, aluminum, brass, bronze, wood, ceramic, etc. to itself or each other.

Savings of up to 50% in maintenance of syrup line valves are reported by the Royal Crown Bottlers of Dallas, Texas. Valves used previously did not prevent syrup from abrading internal parts. Erosion made seating uncertain, leaky valves were common and life of valves was short. Changing to Grinnell-Saunders diaphragm valves stopped leakage. Resilient diaphragm seals tightly and keeps syrup from entering bonnet area to stick or clog valve.

Write No. 427 on Inquiry Card—Page 34  
PURCHASING

Economy-minded Purchasing Agents confirm the

# OK in Oakite

when they look for cleaning economies



There are many places, many ways to economize on cleaning... if you help yourself to the expert in-plant service offered by your local Oakite Technical Representative.

Maybe he'll find a way to reduce per-unit production costs on your metal-fabricating prepaint treatment. Or, perhaps discover a manual or mechanized method to save you money on such diverse operations as cafeteria sanitation, paint stripping, spray booth maintenance, cleaning aluminum, washing floors. He has a wide variety of compounds.

They are designed to give you highest quality production and maintenance cleaning at the lowest possible cost.

The Oakite man looks to reduce your inventory through consolidation of materials where possible. He recommends using most efficient materials... and time and cost-saving methods where not now used. In short, if there are economies to be found, he's a good man to ferret them out. Ask Oakite.

Oakite Products, Inc., 54 Rector Street, New York 6, N. Y.

#### IT'S GOOD PURCHASING POLICY TO ASK OAKITE ABOUT:

- Aluminum Cleaners, Etchants
- Cafeteria Sanitation
- Coach Washing Compounds
- Descalants; Derustants
- Hot Tank Cleaners
- Paint Strippers
- Prepaint Phosphate Treatment
- Steam-Detergent Cleaning Guns
- Barrel Finishing Compounds
- Chemical Sterilization
- Conversion Coatings
- Electrocleaners
- In-Place Cleaning Heat Exchangers
- Plant Maintenance Cleaning
- Spray Booth Maintenance
- other Mechanized Cleaning Methods



For More Information Write No. 800 on Inquiry Card—Page 34

## MRO and Safety Supplies



### Forging Lubricant Saves Brass Co. \$15,000 to \$17,000 Annually

The Mueller Brass Co. has been saving between \$15,000 and \$17,000 annually in lubrication-application on time through use on all crank forging presses of "Prodag," a dispersed graphite lubricant from the Acheson Colloids Co. Time savings results from spraying the dies rather than swabbing with petroleum-based liquid. Other advantages are improvement in die life, reduction in scrap and better finish on forgings.

WRITE NO. 801 ON INQUIRY CARD—PAGE 34



### Non-Woven Nylon Floor Maintenance Pads Solve Splashing Problem

The marble frontpiece of the vault at the Fifth Avenue office of the Manufacturer's Trust Co. is in full public view night and day. Methods of floor maintenance previously used ruined appearance by throwing "scrub mud" onto surface. Handi-Man, Inc., which handles the maintenance, solved the problem by using "Scotch-Brite" floor maintenance pads from Minnesota Mining and Mfg. Non-woven nylon construction eliminates splashing by keeping scrubbing solution under machine where it belongs.

WRITE NO. 802 ON INQUIRY CARD—PAGE 34



### Glass Drainage Line Speeds Installation Time, Cuts Costs

At its new research center in Wichita the Frontier Chemical Co. specified glass piping and fittings for its 200 ft. underground chemical waste drainage line. Installation time and labor costs were cut through use of one-piece, factory-assembled couplings engineered for quick, permanent compression joints. Flexibility of joints permitted burial, and Pyrex drainline is guaranteed by Corning Glass Works against breakdown from corrosion or joint leakage for lifetime of building.

WRITE NO. 803 ON INQUIRY CARD—PAGE 34



easy to clean...

## Alan Wood Super Diamond floor plate sheds dirt and water quickly

Sweep it, hose it or mop it—A. W. Super Diamond rolled steel floor plate has no pockets to hold dirt or water. The perfectly designed pattern of Super Diamond makes it the easiest-cleaning floor plate on the market today. You can shear, form, weld and match this floor plate wherever necessary, and the unique arrangement of the pattern allows you to bend it any place.

Super Diamond has many other advantages, too . . . an easily matched well-known design pattern . . . and readily available from warehouses. It wears indefinitely, with no chipping, cracking or splintering. And feet get traction from every direction, even when plates are wet.

For safety . . . for easy installation . . . for long wear . . . specify Alan Wood Super Diamond. Write for Bulletin SD-S5.



### ALAN WOOD STEEL COMPANY CONSHOHOCKEN, PA.

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Los Angeles • Boston • Atlanta  
Cincinnati • Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul • San Francisco • Seattle  
Montreal, Toronto and Vancouver, Canada: A. C. Leslie & Co., Ltd.

For More Information Write No. 804 on Inquiry Card—Page 34  
MAY 23, 1960

For More Information about ad on following page Write No. 805 on Inquiry Card - pg. 34→  
487

# A beauty of a buy!



New High Styled Heavy-Duty  
**BLACK & DECKER VACUUM CLEANERS**

**WHISPER-QUIET**

**EXTRA POWER**

**WET OR DRY**



New No. 25



No. 35



No. 65

## Black & Decker <sup>Heavy Duty</sup> Vacuum Cleaners designed to suit your every need

Take the new No. 25 Heavy-Duty, for example. Here's *whisper-quiet* cleaning in a new concept of industrial vacuuming. The 25's swivel top permits cleaning a 15' circle without moving the vacuum. And when the job's done just throw away the disposable bag! With power to spare the No. 25 is the most compact heavy-duty vacuum on the market.

Other models, ideal for general office, factory and furnace room use, are the No. 35 ( $\frac{1}{2}$  bushel capacity); No. 65 for wet and dry cleaning; No. 95 for extra capacity and power. No. 55 for super capacity (50 gallons); and No. 648, designed for efficient furnace cleaning.

Whatever your cleaning needs call on B&D power, capacity, quietness. See the line soon. Mail coupon for free demonstration.



LEADING DISTRIBUTORS EVERYWHERE SELL

**Black & Decker®**

QUALITY ELECTRIC TOOLS



Capacity plus Power  
... No. 95



Super-Capacity Cleaning  
... No. 55



THE BLACK & DECKER MFG. CO., Dept. 1705  
Towson 4, Maryland (In Canada: Brockville, Ont.)

- Please arrange a demonstration of  
 Please send additional information on

Name..... Title.....

Company.....

Address.....

City..... Zone..... State.....



Drills



Saws

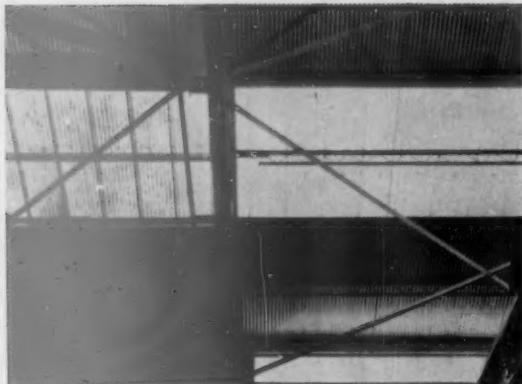


Scrubers®



Belt Sanders

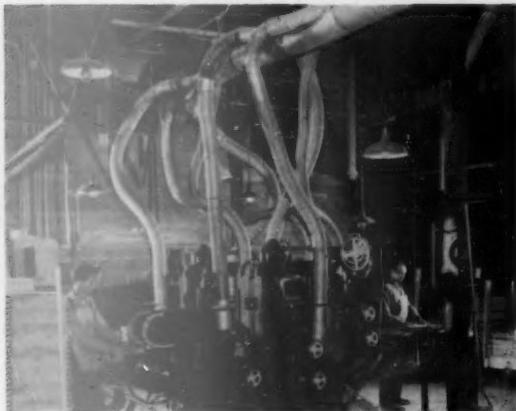
## MRO and Safety Supplies



### **Supersmooth Fiberglass Skylights Improve Lighting, Reduce Maintenance**

The W & W Steel Co. of Oklahoma City credits supersmooth, translucent fiberglass reinforced plastic skylights from the Filon Plastics Corp. for enduring, even light distribution, and resultant production increase and accident decrease. Unlike rough-textured material, smooth-finished Filon skylights discourage dirt accumulation in microscopic crevices. Wind and rain make new skylights "self-cleaning."

**WRITE NO. 806 ON INQUIRY CARD—PAGE 34**



### **Burning Wood Dust Saves \$13,000 Yearly in Fuel Costs**

A Pangborn central dust control system is used by the Rowe Mfg. Co. of Galesburg, Ill., to exhaust chips and dust from more than 100 wood-working machines to its boilers for burning. Savings of more than \$13,000 annually in fuel bills have been achieved. Even more important are increased production, lowered machine maintenance and plant housekeeping costs, and vast improvement in employee and community relations due to dust-trapping system.

**WRITE NO. 807 ON INQUIRY CARD—PAGE 34**



### **Plastic Coated Conduit Licks Tough Corrosion Problem**

Corrosive atmospheres in coke oven areas at the Republic Steel Corp. destroyed galvanized electrical conduit in five years, requiring continual replacement. But the company has found a solution. It is now using a lightwall steel tubing that is plastic coated to make it impervious to corrosive fumes and dusts. Five thousand feet of Dekoron-Coated conduit, made by the company's own Steel and Tube Division, was installed 18 months ago and is still in good condition.

**WRITE NO. 808 ON INQUIRY CARD—PAGE 34**

For More Information about ad on facing page Write No. 809 on Inquiry Card - pg. 34→

PURCHASING

# HALLOWELL

## SHOP EQUIPMENT

Rugged, functional, versatile...  
custom in everything but price!



### OPEN BENCHES

Arrangeable, changeable, economical. Rugged construction. 4 leg heights, 4 top materials, 4 lengths, 5 widths—the widest selection in the industry. Choice of top and base accessories.



### CABINET BENCHES

Functional, good looking, plenty of protected storage space. 3 lengths, 4 top materials. Many interchangeable accessories.



### UNIT BENCHES

Wide variety of arrangements and accessories. Versatile, interchangeable drawer or cabinet pedestals. 2 lengths, 2 widths, 2 heights, 4 top materials.



### SHOP DESKS

Large, smooth writing surface. Drawers glide on bearings. Recessed pulls. Three standard models, plus K.D. parts for custom assembly.



### STOOLS and CHAIRS

Great variety. Set-up or K.D. Fixed or adjustable heights. Tubular or channel legs. Steel or Preswood and steel seats—round or contoured—revolving or stationary. Optional foam rubber seat and backrest covers available.



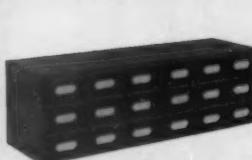
### TOOL STANDS

Built to take a beating. Four sizes, with drawers, trays, cabinet bases. Drawers in single or double tiers. Available with steel or rubber casters.



### INDUSTRIAL CABINETS

Floor, wall and caster models. Safe, neat storage. Flush bases, detachable feet. Steel or rubber tread casters. Six sizes from 21 to 75 in. high.



### STORAGE WALLS

Use individually or stack to form storage walls or partitions. Units available with 12, 16, 18, 24 or 32 drawers.



### ERECTOMATIC® SHELVING

Exclusive features cut assembly time. Each shelf can be independently positioned. Stores up to 20% more in the same space. Interchangeable parts and accessories.



### STEEL SHELVING

Use basic units individually or in combination. Ledge, counter and vertical types. Multiple pierced, precision formed for easy assembly.

#### MAIL COUPON TODAY

COLUMBIA-HALLOWELL Division SPS Jenkintown 31, Pa.  
Please send me the Full Line Columbia-Hallowell Shop Equipment Catalog.

NAME \_\_\_\_\_ Please Print \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

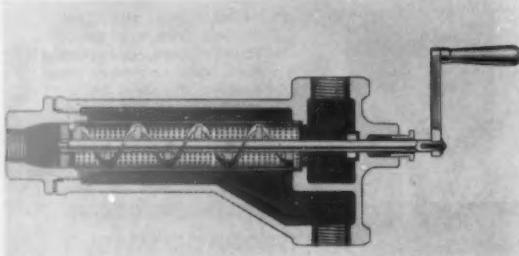
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

COLUMBIA-HALLOWELL Division

**SPS**

where reliability replaces probability

JENKINTOWN, PA. • SPS WESTERN, SANTA ANA, CAL.



**Rotary Scraper Strainer Boosts  
Efficiency of Air-Conditioning**

The air-conditioning units at Inland Steel's East Chicago offices were periodically out of action. Cause was need for frequent cleaning of screens, due to presence of fine sand in water drawn directly from Lake Michigan. Problem was solved by installation of Sarco VRS Rotary Scraper Strainers. These units incorporate hand-crank operated helical scraper knife within the cylindrical strainer screen. Strainer can be kept clean without necessity of shutting down the unit or dismantling the strainer.

**WRITE NO. 634 ON INQUIRY CARD—PAGE 34**



**Enclosures Protect Freight,  
Avoid Weather Problem**

At a new warehouse extension of John H. Breck, Inc., at Springfield, Mass., loading docks are equipped with tailor-made enclosures made of Reeves Brothers Coverlight-N neoprene coated nylon. Completely weather-resistant and waterproof, Coverlight has none of maintenance costs encountered with other material in older section of warehouse. Material is non-absorbent and does not get heavy in rain or stiff during frost. Heating costs are down, working conditions better and spoilage of merchandise eliminated.

**WRITE NO. 635 ON INQUIRY CARD—PAGE 34**



**Foundry Pump Needs Less Maintenance  
Despite Sand and Slag**

Recirculating water under high pressure when it contains sand, slag and other gritty particles poses special problems. Working with a casting washer machine at a Massachusetts foundry, a Moyno "progressing cavity" pump solves them. Large semi-automatic Moyno provides 300 lbs of pressure behind stream of water to flush cores away at close ranges. One man does in 8 hrs. what used to take five men 12 hrs. Previous pump required overhaul every 9 months. Moyno ran 38 months without major repair.

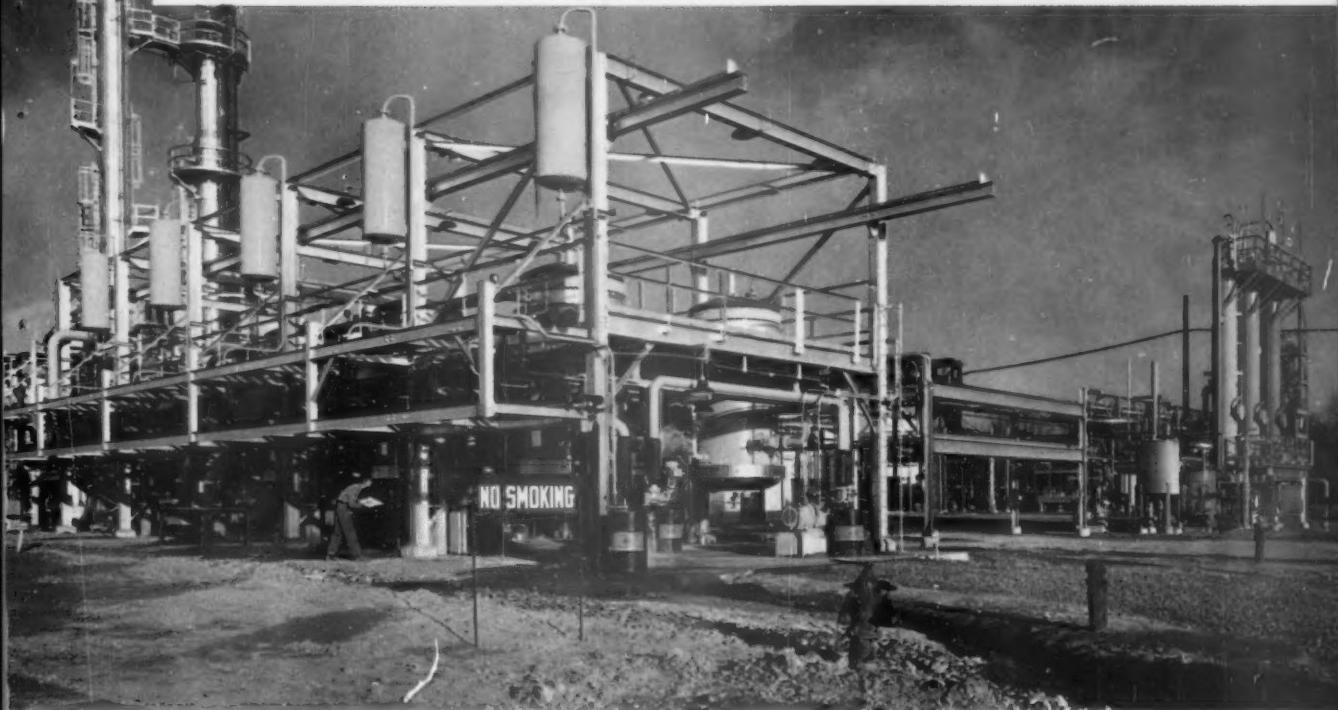
**WRITE NO. 636 ON INQUIRY CARD—PAGE 34**

For More Information about ad on facing page Write No. 637 on Inquiry Card - pg. 34→

**PURCHASING**

# CORROSION PROTECTION

## *In Depth . . . With Color!*



Wherever your plant and equipment are subject to critical acid, alkali or solvent exposures even at elevated temperatures, high humidity, severe weathering — or any combination of these — one of Truscon's corrosion control systems will provide maximum protection at lowest cost per square foot per year.

Truscon will also provide guidance in proper surface preparation, coating application, and inspection. For a detailed, written specification on protection of steel, iron, aluminum, concrete, and other surfaces, call the Truscon branch nearest you, or write Truscon Laboratories for specific information.

# TRUSCON

*Laboratories*



Industrial Maintenance Division of Devoe & Reynolds Co., Inc. • Detroit 11, Michigan

## MRO and Safety Supplies



### Rotoblast Cleans Bus Wheels Eighteen Times Faster

Installation of a Rotoblast table-room by the Toronto Transit Commission's vehicle repair shop has changed a full-time job for three men into a part-time job for one man. Necessary removal of paint, rust and scale from one bus wheel by hand scraping and wire-brushing took one man-hour. With relatively small (4 ft. dia. work table) Rotoblast, and including handling time, production averages 18 wheels per man hour.

WRITE NO. 638 ON INQUIRY CARD—PAGE 34



### Water Chilling System Saves \$10,615 a Year

The Venus Pen & Pencil Corp. uses chilled water to cool calender rolls which process rubber for pencil erasers. Tap water proved unsatisfactory because of variation in temperature. A Chrysler Airtemp liquid chiller now maintains water at even 50 degrees F., saving \$10,615 a year in maintenance costs, by reducing the quantity of water used, and in fewer rejects because of improvement in rubber quality.

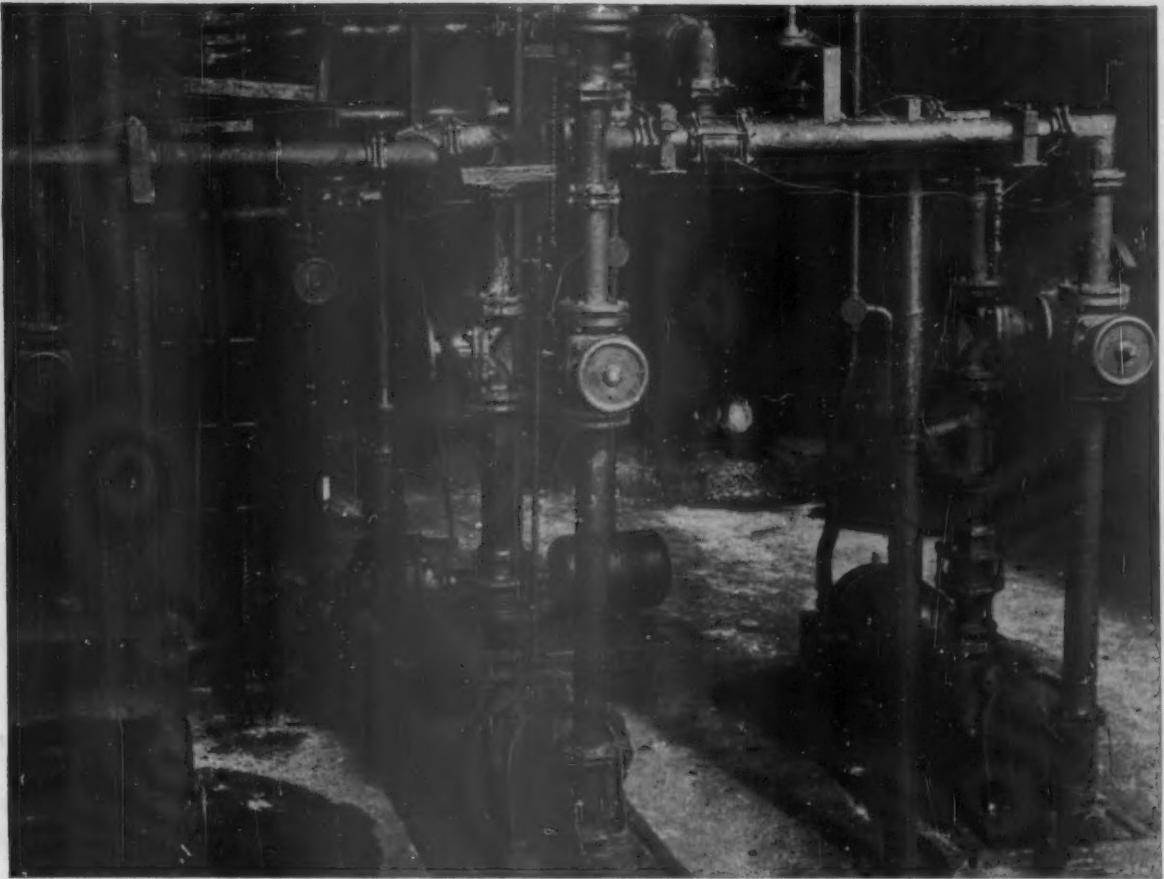
WRITE NO. 639 ON INQUIRY CARD—PAGE 34



### Fiberglass Panes Solve Window Breakage Problem

A plague of shattered windows ended shortly after the Coleman Cable & Wire Co., River Grove, Ill., replaced glass with fiberglass reinforced plastic panes manufactured by Filon Plastics Co., Hawthorne, Calif. The translucent, light-diffusing panes also improved plant's air conditioning because they don't conduct heat or cold as readily as glass, and eliminated glare for machine operators facing windows.

WRITE NO. 640 ON INQUIRY CARD—PAGE 34



Glass-lined Grinnell-Saunders Valves, with Teflon Diaphragms, on benzene hexachloride lines at Diamond Alkali's Greens Bayou, Texas, plant. Hundreds of other Grinnell Diaphragm Valves are used in other areas of the plant.

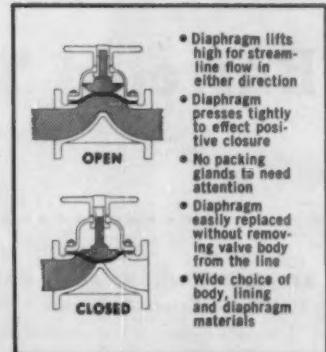
## How a manufacturer of benzene hexachloride solved a serious valve leakage problem

Valving at Diamond Alkali's Greens Bayou, Texas, plant had become expensive. Leakage of a product containing 30% to 40% benzene and free chlorine released fumes and caused rapid corrosion of the metal parts of the valves used previously, as well as of adjacent equipment.

This problem was corrected when Grinnell-Saunders Diaphragm Valves were used. The first replacement of any part of the Grinnell Valves did not occur for two years, and this was the diaphragm only. The former valves had

to be completely replaced every one to two months! Bodies of the Grinnell valves lasted four years. In short, when Grinnell-Saunders Diaphragm Valves were installed, stem leaks ceased; corrosion was eliminated; and downtime to install new valves was practically ended.

For further facts about Grinnell-Saunders Valves, see Grinnell's insert in Chemical Engineering Catalog, or Sweet's Plant Engineering File — or write directly to Grinnell Company, Providence 1, Rhode Island.



## GRINNELL-SAUNDERS DIAPHRAGM VALVES

GRINNELL COMPANY, PROVIDENCE 1, R. I. • BRANCH WAREHOUSES AND DISTRIBUTORS FROM COAST TO COAST  
PIPE FITTINGS • VALVES • PIPE HANGERS • PREFABRICATED PIPING • UNIT HEATERS • PIPING SPECIALTIES



For More Information Write No. 641 on Inquiry Card—Page 34

MAY 23, 1960

For More Information about ad on following page Write No. 642 on Inquiry Card - pg. 34-495

# Saves on the "Lion's Share"!

**Barreled Sunlight helps you cut costs on the biggest percentage of your plant painting budget**

**There's no denying** that labor costs take a lion's share of plant paint-maintenance budgets. *At least 80¢ out of every painting dollar!* And this is why Barreled Sunlight Paints have been specially engineered — to help you make important savings in this critical area.

**Fast, easy application** is only one of many labor-saving advantages working in your favor when you specify Barreled Sunlight *Engineered Paints*. Their measurably greater "hiding power" means fewer passes with brush, spray gun or roller . . . far better coverage with far less paint. Also, their engineered ability to resist wear means fewer paint jobs over the years. So you not only pay less in initial labor costs, but you also pay less in the long run for materials and painting man-hours as well.

**It will pay you well** to learn more about the budget-balancing advantages of Barreled Sunlight Engineered Paints. Start now by sending for your free copy of our informative booklet — "HOW TO REDUCE PAINTING COSTS."

## Barreled Sunlight



FOR A BETTER LOOKING, LONGER LASTING PAINT JOB AT LOWER COST

### BARRELED SUNLIGHT PAINT COMPANY

18-E Dudley Street, Providence 1, Rhode Island

- We're interested in cutting our plant paint costs . . . please send me your free booklet, *How To Reduce Painting Costs*.
- Also, at no obligation, please have your representative call me to arrange a free Barreled Sunlight "On-The-Wall" Test.

Name.....

Title.....

Company.....

Street.....

City..... Zone..... State.....





Barreled  
Sunlight

Paints



### Gage Unit Produces Impressive Savings in Gaging Costs

Pitney-Bowes has achieved impressive savings in gage inventory and gage design time. Formerly, many gages were needed, each good for only a single dimension. Today the manufacturer of postage meters and business machines uses Versa-Dial from Standard Gage Co., a basic indicating gage unit to which can be attached various anvils and jaws to suit differing sizes and shapes of parts to be measured.

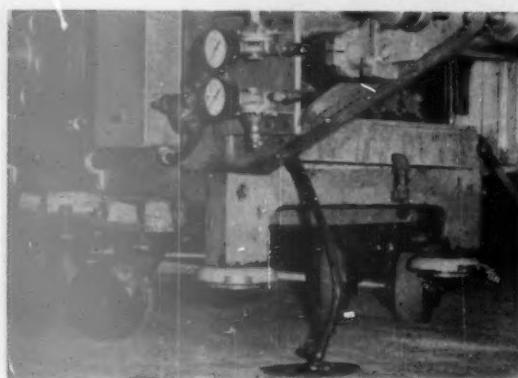
**WRITE NO. 643 ON INQUIRY CARD—PAGE 34**



### Diesel-Driven Electric Plant for Tug Saves \$2500 Annually

A prominent construction firm is saving approximately \$2500 annually in fuel costs alone by installing a Diesel-driven, 6,000-watt Onan Electric Plant in their tugboat, the "Leslie Ann." A comparable unit, powered by gasoline, operating for an equivalent period of time, would use some \$3600 for fuel, as opposed to \$1080 for Diesel oil. The greater initial investment for the Diesel generating set is swiftly amortized within a one-year period.

**WRITE NO. 644 ON INQUIRY CARD—PAGE 34**



### Leveling Machinery Mounts Give Flexible Production Layout

Flexible production lines are essential at Johnson & Johnson, where production changes in surgical dressings division are constant. Machine-leveling Barry Mounts provided the answer. Changeover time was reduced from 6 hours to 1, labor from 7 men to 3, eliminating 39 man-hours of costly overtime per machine. In addition, maintenance repairs are easier, and vibration problems eliminated, permitting precision machines to operate at higher speeds with closer tolerances.

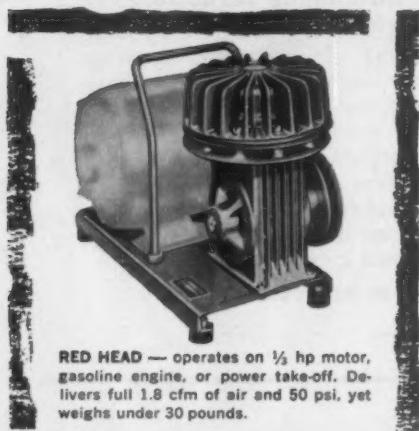
**WRITE NO. 645 ON INQUIRY CARD—PAGE 34**

# JOHNSON AIR COMPRESSORS

→38

POWER-PACKED MODELS FOR EVERY INDUSTRIAL USE—

PAINT TOUCH-UP, COLOR ZONING, BUILDING AND GROUNDS MAINTENANCE



**RED HEAD** — operates on  $\frac{1}{2}$  hp motor, gasoline engine, or power take-off. Delivers full 1.8 cfm of air and 50 psi, yet weighs under 30 pounds.

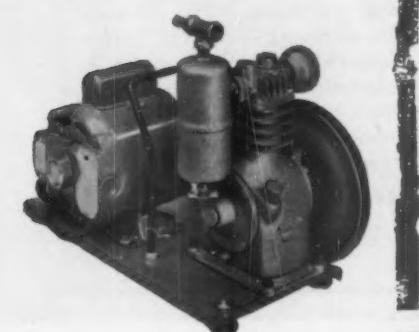
Johnson makes a wide line of compressors and accessories — provides one dependable source of air for all your needs.

Johnson air compressors are built to the same high quality standards that have made the Johnson name famous for precision pneumatic equipment throughout the world for 75 years. Result: compressors that deliver more air volume per pound pressure per horsepower per dollar!

And now there's no need to wait. You get immediate delivery from distributor stocks.



**THE "200" SERIES** — Large capacity piston-type units handle any air requirement up to 1.0 cfm at 90 psi. Available with or without storage tank.



**THE "400" SERIES** — Heavy-duty piston compressors deliver up to 2.8 cfm of air and up to 125 psi. Available with horizontal or vertical tank.



## JOHNSON SERVICE COMPANY



Compressor Division, Dept. BN, Milwaukee 1, Wisconsin

Name & Title.....

Firm.....

Address.....

City..... Zone..... State.....

Please send me  
your new catalog  
on Johnson  
Air Compressors  
and Accessories.

For More Information Write No. 646 on Inquiry Card—Page 34

MAY 23, 1960

499

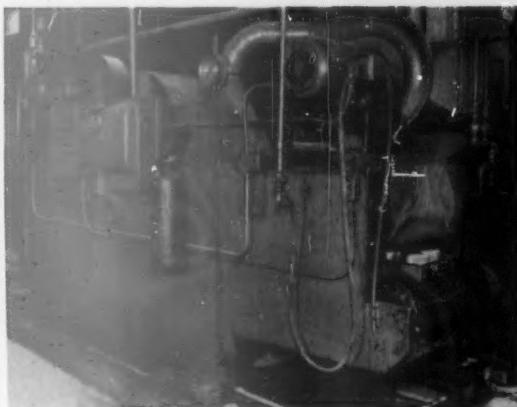
## MRO and Safety Supplies



### Catalytic Exhaust Purifier Helps in Maintenance Scrubbing

SKF Industries are saving one-third by doing their own scrubbing of manufacturing areas, using a gasoline-driven scrubber and two gasoline-powered sweepers. In switching to self-maintenance, SKF specified that equipment be fitted with Oxy-Catalyst exhaust purifier. Oxy-Catalyst purifier cleans up carbon monoxide 95% or better on unleaded-gasoline vehicles and eliminates 92% of exhaust hydrocarbons and 89% of aldehydes at governed speeds.

WRITE NO. 647 ON INQUIRY CARD—PAGE 34



### Metal Stamping Company Solves Rust Problem at Lower Cost

A metal stamping company had been troubled with rusting following the use of an alkaline cleaner in a single stage spray type washer. The soil to be removed was a pigmented drawing compound used in the stamping operation. Cerfa-Kleen HPW, manufactured by E. F. Houghton & Co., was used at a concentration of 2 ounces per gallon of water, replacing a caustic type cleaner. This provided adequate rust protection and was found to cost \$.03 per pound less.

WRITE NO. 648 ON INQUIRY CARD—PAGE 34



### Dual Purpose Cutting Oil Serves Separate Requirements

Use of a Gulf dual purpose cutting oil on two Conomatic bar machines has enabled a General Electric plant to achieve operating economies with no sacrifice of machine speeds or performance. Gulfcut 41B cutting oil is a sulfo-chlorinated fatty oil which accomplishes two separate and sometimes conflicting purposes, serving both as a cutting fluid and as a lubricant. Dual effect is result of blending right grades of additives in proper proportions for each job.

WHITE NO. 649 ON INQUIRY CARD—PAGE 34

For More Information about ad on facing page Write No. 650 on Inquiry Card - pg. 34→



## UNRULY UREA TOES THE LINE FOR 6 SOLID YEARS

Another demonstration of how well Aloyco Valves withstand the worst kind of corrosive conditions...many more years of service are expected.

That's why engineers at Deere & Company's giant \$20 million Oklahoma plant (went on stream in 1954) put many more Aloyco Valves to work. They buy performance. You'll find Aloyco Stainless Steel Valves in scores of processing plants, wherever severe conditions present difficult valve problems. Want to know more? Write: Alloy Steel Products Co., Inc., 1312 West Elizabeth Ave., Linden, New Jersey. o.a



**ALLOY STEEL PRODUCTS COMPANY**

Boston • New York • Wilmington • Atlanta • Birmingham • Baton Rouge • Buffalo • Pittsburgh • Chicago • St. Louis • San Francisco • Los Angeles • Seattle





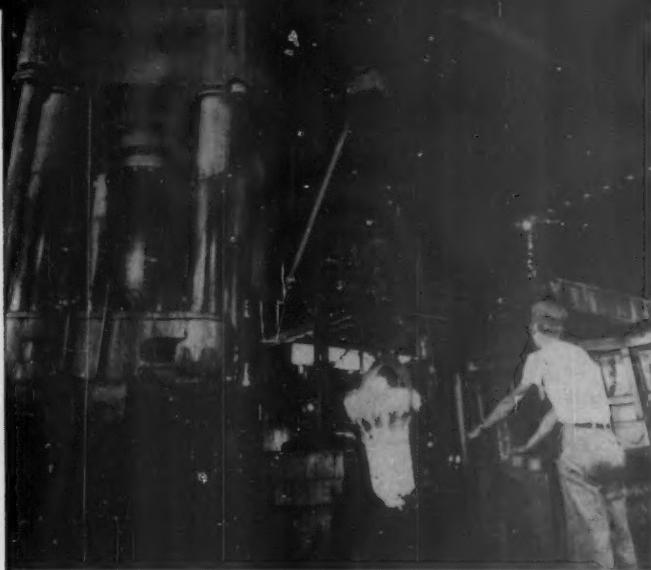
Bearing life increased at least two and one-half times with  
Gulfcrrown Grease E.P. on Green River Steel soaking pit covers.

**Gains 36% more production, saves \$5,000 a week, by**

# **GULF MAKES THINGS**

"We've discovered what important savings can be made by simply changing from one grease to another," says Henry J. Werner, Maintenance Superintendent, Green River Steel Corporation, Owensboro, Kentucky. "We were having trouble with the bearings on our soaking pit covers. The grease kept melting out. This meant shutting down the pits, at a downtime cost of \$650 an hour. When they're down, we're not pressing steel."

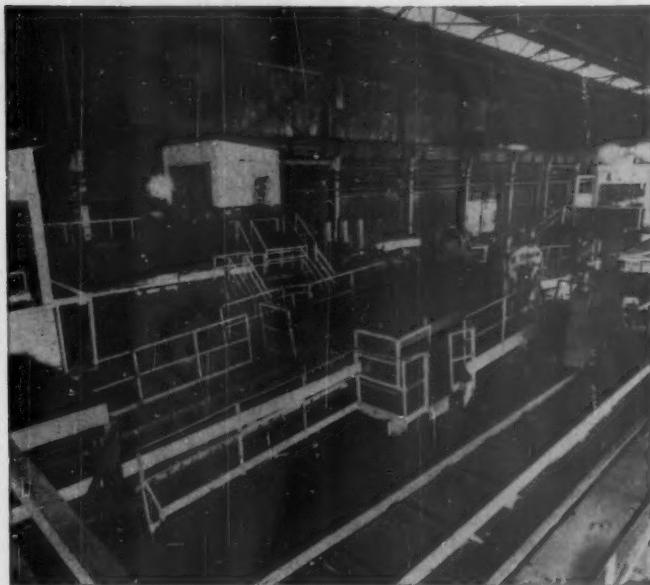
Gulf engineers recommended Gulfcrrown Grease E.P., a multi-purpose lithium base grease formulated for unusually heavy bearing loads and high temperatures. "Now," Mr. Werner says, "we have not changed a bearing in the ten weeks the new grease has been in use. We used to replace each bearing every four weeks. Downtime has been cut from 12 hours a week to 4, a weekly savings of \$5,000. This has resulted in an increase of our average



Gulf Harmony oil protects against rust and foam in hydraulic systems of Green River's forging presses.



Manipulator, lubricated with Gulfcrown Grease E.P., places billet in forging press.



Longer gear and bearing life on Green River's blooming mill, intermediate and finishing stands is assured by the use of Gulf E.P. lubricants.



Left to right, Marshall Ringo, Gulf Sales Representative, Thomas J. Bartlett, Jr., Gulf Owensboro Distributor, Nelson C. Walker, Executive Assistant to the President, Green River Steel Corp., and George Carney, Gulf District Manager.

## switch to Gulfcrown® Grease E.P. RUN BETTER!

production of 36%, or 702 tons a week."

Based on this experience, Green River plans to standardize on Gulfcrown Grease E.P. for grease applications. To protect against rust and foam in hydraulic systems throughout the mill, Gulf Harmony® oil is used.

Perhaps a Gulf Sales Engineer can help you improve your lubricating practice, and help you make sizeable dollar savings. Just call the nearest Gulf office.

**GULF OIL CORPORATION**  
Department DM, Gulf Building  
Pittsburgh 30, Pennsylvania





SEE a demonstration by a specialist

**SOFTER**  
scrubbing action  
**GENTLER**  
sudsing action  
**SOOTHING**  
lanolin action

**NEW!**  
non-depleting  
**LAN-O-KLEEN® PLUS**  
Hand Cleaner

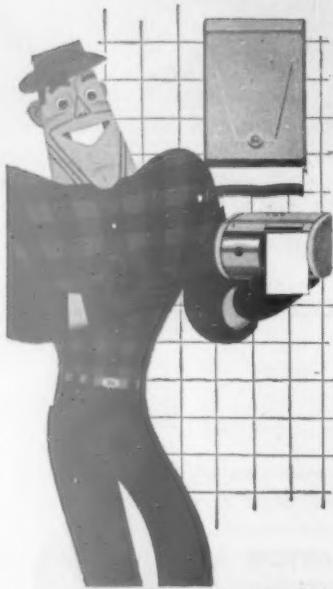
for FREE demonstration or literature address:  
**WEST CHEMICAL PRODUCTS INC.**, 42-24 West St., Long Island City 1, N.Y.  
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

For More Information Write No. 652 on Inquiry Card—Page 34



**TOM BIGBEE SAYS:**

"as important as the  
coffee break to employee morale  
... clean, neat washrooms!"



Washroom maintenance is easier and more economical with Marathon industrial towels, tissue, and attractive metal dispensers designed to discourage waste and pilferage. Marathon washroom products are extra absorbent, doing the job better with less. The twin-roll tissue dispenser reduces waste and provides neater, cleaner washrooms with half the maintenance time. Ask your Marathon paper merchant for full details.

**marathon**

A Division of American Can Company  
MENASHA, WISCONSIN

Single-, multi- or C-fold towels, bleached or unbleached.  
Service Roll or Dorsette Facial Grade Tissue. Dispensers.

For More Information Write No. 653 on Inquiry Card—Page 34

For More Information about ad on preceding  
←page Write No. 651 on Inquiry Card—pg. 34

504

### Twin Problem Solved by Steel-Jacketed PVC Pipe



At the Texaco refinery at Port Arthur, Texas, corrosion-resistant PVC pipe was called for on two applications, but the strength of steel was also required. In one case pipe had to be buried in soft, unstable earth; in the other pipe had to span 22 ft. spaces between support trusses. Steel-jacketed PVC pipe from Jones & Laughlin solved both problems. "Jal-Jacket" is PVC pipe with .065 in. wall thickness bonded mechanically to interior of electric resistance-welded carbon steel pipe with .120 in. wall.

Write No. 820 on Inquiry Card—Page 34

### Extra Strength with Epoxy Mortar Floor



An epoxy mortar floor supplies extra strength for push trucks in a warehousing area converted from office space by Spiegel, Inc., the mail order house. Installed by Camp Co. of Chicago, with epoxy resin for the mortar from the Dow Chemical Co., the new surface is only  $\frac{1}{8}$  in. thick over a concrete slab. It provides a tough yet resilient covering with extreme resistance to corrosion and physical wear.

Write No. 821 on Inquiry Card—Page 34

PURCHASING



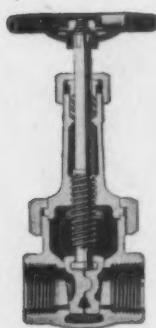
## No other 125 lb. Union Bonnet Bronze Gate Valve

**has all these features** *Union Bonnet* for extra safety . . .

cylindrical body design to distribute pressure uniformly and prevent distortion . . .

extra thickness at points of greatest strain . . . these features *alone* provide the vital margin of superiority over other valves in its class. Together with

Stemalloy Stems®, Non-Slip® Handwheels, and many other exclusive features, they actually put this outstanding new valve in a class by itself. You will see why when you compare it part-for-part with any other valve designed for similar service. Let your Lunkenheimer Distributor make this comparison for you, or write the Lunkenheimer Company, Cincinnati 14, Ohio.



You Can't Find  
the Cost of  
a Valve on a  
Price List



• BRONZE • IRON • STEEL • PVC  
**LUNKENHEIMER**  
THE ONE *Great* NAME IN VALVES

L-300-65

For More Information Write No. 654 on Inquiry Card—Page 34

MAY 23, 1960

505



**SYSTEM** of Penco T-line Boltless Steel Shelving in this huge operation added 15% more storage space over previous facilities. Clean, efficient layout (involving almost four miles of shelving) speeds processing, cuts manpower and housekeeping costs, reduces fire hazard.



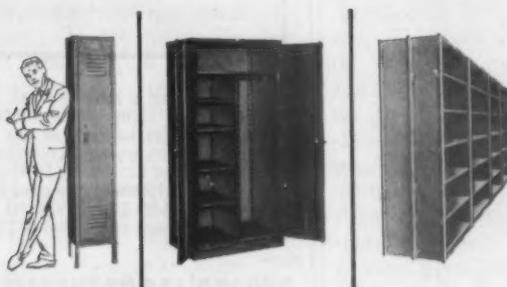
**PENCO-PLANNED** locker rooms encourage neatness, employee pride and efficiency. And the lockers will provide long term, attractive, trouble-free service.



**PENCO SHELVING** lets you utilize space from floor to ceiling, keeps valuable stocks off floors, tightens inventory control, helps employees work faster, more smoothly.



**GLEAMING FINISH** on all Penco Steel Lockers will remain permanent as a result of a special, pre-enamel phosphatizing step that assures a tight enamel bond, permanent tough finish!



## These are tools, too!

Storage is as active a part of over-all plant operations as production lines or tools. Whatever your storage needs and space, large or small, Penco Planning can show you how to put Penco steel lockers, cabinets and shelving to work to produce savings. Penco-planned storage helps speed materials handling, break bottle-necks, cut damage to parts and products, slash inventory time, streamline plant housekeeping and control pilfering.

When can your Penco Dealer give you a hand? Write direct for helpful catalogs: General Shelving Catalog No. 2400; Locker Catalog No. 6000.



**ALAN WOOD STEEL COMPANY**

**PENCO DIVISION**

410 Brower Avenue, Oaks, Pennsylvania  
Steel Lockers • Steel Cabinets • Steel Shelving • Book Case Units



**PENCO PLANNING** can help you have an "industrial filing system" to feed production lines, protect costly parts, systematize any operation in your plant!

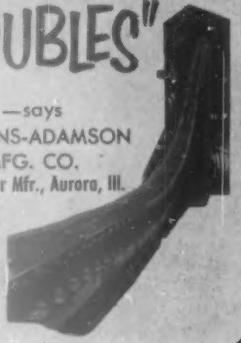


**PENCO T-LINE** Boltless Steel Shelving is assembled fast with efficient channel clips that slip into place without tools. You can cut original installation labor costs up to 50%. Penco Shelves are easy and fast to rearrange as required.

For More Information Write No. 655 on Inquiry Card—Page 34

# "NO MORE LUBRICATION TROUBLES"

—says  
STEPHENS-ADAMSON  
MFG. CO.  
Conveyor Mfr., Aurora, Ill.



"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

## REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

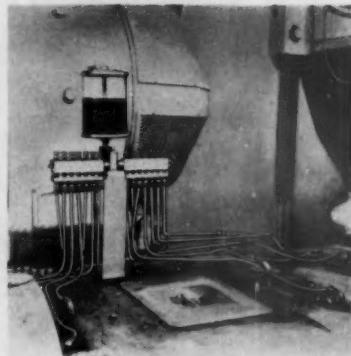
LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



For More Information Write No. 656 on Inquiry Card—Page 34

## Automatic Lubrication Reduces Cost 74%



Conversion from manual to automatic lubrication produced a cost reduction of 74% for the Nordberg Mfg. Co. of Milwaukee. Each 100 in. boring mill was previously equipped with 30 manual oilers and had to be shut down for 10 min. a day to fill oil cups. Oil spillage was safety hazard, and waste and bearing damage were high. Today three automatic Oil-Rite oilers on each machine insure proper lubrication, require filling only once a week, and cut man hours and waste.

Write No. 822 on Inquiry Card—Page 34

## Duct Insulation Method Gives More Protection



When applying insulation to rectangular ducts, every seam is a potential trouble spot. At the U.S. Public Health Service hospital, Carville, La., Samdot Insulations used semi-rigid insulation notched to bend around the corners, putting the seams at the side of the air conditioning duct and eliminating seam along bottom edges. Six-pound spun mineral wool felt insulation with vapor barrier is manufactured by Baldwin-Ehret-Hill, Inc.

Write No. 830 on Inquiry Card—Page 34

# "THIS LUBRICANT SAVED US \$2,098.16 IN SEVEN MONTHS"

—says THE BROWN COMPANY Quality Paper Makers of Berlin, N. H.

During a seven-month period before using LUBRIPLATE No. 130-AA in the bearing of our Kraft Mill Lime Kiln, we used a conventional oil at a cost of \$2,134.00. In the seven months that followed, we used LUBRIPLATE No. 130-AA for initial greasing and replacement at the cost of \$35.84.

## REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

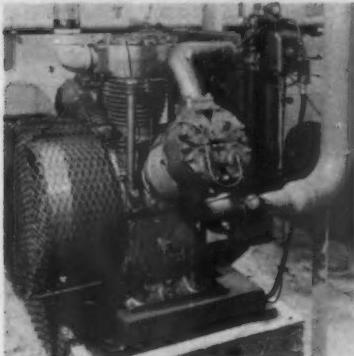
For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



For More Information Write No. 657 on Inquiry Card—Page 34

PURCHASING

**Air Compressor Speeds Production of Tire Boots**



At the Bowes Seal Fast Corp., more than six million tire repair sections (boots) annually are coated with liquid latex by a spray system. Production time on operation, which was formerly done with hand rollers, has been cut more than 25% by changing to a spray system powered by a Le Roi stationary air compressor. Unit supplies all the air needed in the manufacture of some 2000 items for automotive repairs.

Write No. 828 on Inquiry Card—Page 34

**Holdown Clamps Solve Problem**



The Schacht Steel Construction, Inc., faced a problem milling longitudinal filler plates requiring a  $\frac{1}{8}$  in. taper across the 5 in. face on a 3 HP Baldwin Futuremill. "C" clamps proved of no value, welding was costly and time consuming and countersinking holding bolts was not permissible. Problem was solved by mounting counter and fixture clamps from J & S Tool Co. on rigid angle plate, permitting fast loading plus a position "hold down" of the workpiece against the fixture.

Write No. 829 on Inquiry Card—Page 34



**RCA**  
*replace with* **POWER TRIODES**

*for long life in industrial RF power applications*

For reliability, high efficiency and long life in electronic heating and other industrial radio frequency power applications, make it a point to replace with RCA RF Power Triodes available from your local RCA Industrial Tube Distributor.

RCA Power Triodes are conservatively designed to provide efficient operation and long life under industrial conditions. This means less downtime as well as lower tube cost per hour of operation.

Your RCA Industrial Tube Distributor carries a complete line of RCA Power Tubes in a wide range of power and frequency ratings. Call him for immediate service on all your industrial tube needs.



**RADIO CORPORATION OF AMERICA**

*Electron Tube Division*

*Harrison, N.J.*

# 7 WAYS to Judge a Flammable Liquid Safety Can...



## 1. LEAKPROOF CONSTRUCTION

Seams are lap-joined and electrically welded into durable "one-piece" container capable of standing up to rough service.

## 2. "SHOCK-RIM" BOTTOM

Can bottom is raised  $\frac{1}{8}$ " up into can body to provide protective rim around base of can.

## 4. MECHANICALLY JOINED FILL SPOUT

Spout is "clinched" and soldered to top section of the can to withstand strain of repeated opening and closing.

## 6. QUICK-ACTING DISPENSING VALVE

Convenient hand operation gives fast, positive control while pouring. Instantly shuts when pressure is released.

## 3. DOUBLE WALL FLAME ARRESTERS

Inner wall is damaged, outer wall provides protection until unit is replaced.

## 5. LEAKPROOF SPOUT SEAL

Spring operated cap has ball and socket joint assembly to assure uniform, self-adjusting, liquid-tight seal of special leak-resistant gasket.

## 7. SHOCK GUARD CARRYING HANDLE

Handle design shields dispensing lever against accidental opening from shocks or bumps.

Protectoseal Safety Dispensing Cans incorporate these, and many more design and operating features to provide optimum safety and service. Because Protectoseal Safety Cans are built better to serve longer, they are your best buy.

When you are considering the purchase or specification of Flammable Liquid Safety Cans, investigate the "hidden values" you get in Protectoseal Products. Compare them, point by point, with any other can and you will see why they are the quality standard of the industry.

Protectoseal Safety and Storage Cans are made in a wide range of sizes and types. They are stocked in strategically located Protectoseal Warehouses and Service Centers for quick delivery.

Write for the new Catalog of Protectoseal Equipment for the safe storage, handling, and use of flammables.

**THE PROTECTOSEAL COMPANY**

1908 SOUTH WESTERN AVENUE

CHICAGO 8, ILLINOIS

For More Information Write No. 659 on Inquiry Card—Page 34

## Vinyl-Coated Gloves Outwear Leather 4 to 1

Used while strapping steel wire around boxes, leather-palm gloves lasted only two shifts. When Super Werx gloves of vinyl-impregnated fabric were substituted, they wore for eight shifts, reducing glove costs 73%. Heavy-duty glove is designed to replace leather for many operations. It resists abrasions, cuts and snags, is sure-gripping and 100% washable, and outwears 18 oz. cotton gloves six to one.

Write No. 823 on Inquiry Card—Page 34

## Air Wrench Closes Valve Fast in Emergency



At a large Eastern oil company, a breakdown means that a 17 in. exhaust valve must be closed within a minute - and a half to prevent impurities from ruining the catalyst. Yet it took two men five minutes to close

the valve by hand. Now a Size 28M Ingersoll-Rand air-powered angle wrench, which has a speed of 215 rpm at 90 psi pressure, lets one man close valve in 50 seconds.

Write No. 824 on Inquiry Card—Page 34

## King-Size Gage Cuts Testing Cost

For a General Electric project which required diameter measurements at extremely close tolerances, Standard Gage Co. produced a giant gage which made costly, specially designed electronic equipment unnecessary. King-size gage is similar in some respects to Standard's regular line of shallow diameter gages but is twice the size of the largest. Nine-foot gage will measure diameters from 98 to 108 in., and it will measure depths from 0 to 12 in., in increments of .0001 in.

Write No. 825 on Inquiry Card—Page 34



## Why the Purchasing Agent brought his *paper* work to the Boss

Purchasing agents are cost conscious people. Take the P.A. of this company. Recently, he became convinced that something could be done about the high cost of maintenance. Upon investigation he found that switching to Fort Howard Towels and Tissue in company washrooms could save as much as 20% a year on paper costs.

Because Fort Howard Paper Towels are avail-

able in such a wide range of grades and in all well-accepted rolls and folds, *you*, too, can cut costs by selecting the proper grade, fold, pack, and price range to meet your exact requirements.

There is a Fort Howard representative nearby anxious to demonstrate to you how washroom expense can be cut, and happy employee relationships maintained.



### Fort Howard Paper Company

Green Bay, Wisconsin

Sales Offices In New York, Chicago, Los Angeles

America's Most Complete Line of Paper Towels, Tissues and Napkins



© Fort Howard Paper Company

For More Information Write No. 660 on Inquiry Card—Page 34

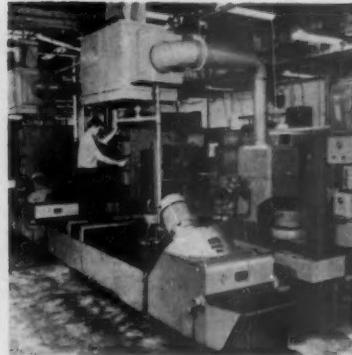
Giant Dryer Leveled without Down Time



A giant paper dryer at the Bowaters Southern Paper Corp. plant developed a  $\frac{1}{4}$  in. list. Level operation was essential for quality production and longer machine life, but difficult leveling task was complicated even further because Bowaters needed continuous production during correction. Problem was solved by use of 12 Simplex Re-Mo-Trol hydraulic rams, each with 50 ton lift capacity, and 3 pumps. Perfect alignment was achieved with no down-time for the drying machine.

Write No. 826 on Inquiry Card—Page 34

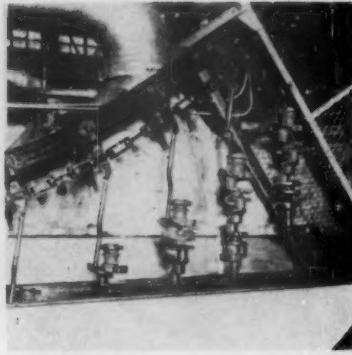
Coolant Clarifier Boosts Efficiency 39%



A De Laval high-capacity centrifugal coolant clarifier has produced a 39% increase in clarification and lowered costs for Avco Corporation's Lycoming Division. With previously used system, filters were removing only 60% of filterable material, and no particles of less than 3 microns. De Laval compact "TurboMatic" operates at 99% efficiency, separates micron-sized contaminants as well as large abrasive material, and eliminates messy and time-consuming maintenance.

Write No. 827 on Inquiry Card—Page 34

Pickling Hooks Last Five Times Longer



Pickling hooks for descaling forged crankshafts at Chevrolet's Forge Standards Dept. corroded rapidly from sulphuric acid attack in 180 degree F. pickling solution. Made of general purpose nickel copper alloy, hooks had to be replaced at an average rate of 152 a year. Company switched to Carpenter No. 20 stainless steel hooks when tests showed they lasted five times longer. Savings from use of Carpenter hooks amounted to more than \$1800 annually.

Write No. 765 on Inquiry Card—Page 34

## Metals Against Highly Corrosive Conditions...



### MARKAL "D-A" COATINGS

afford a lasting protection to metals from the ravages of weather and chemical corrosion, salt spray, sulfur fumes, hot acids . . . at temperatures up to 600° F. Also protects against galvanic corrosion between dissimilar metals. Easy to apply with brush or spray. Ideal for inside or outside use.

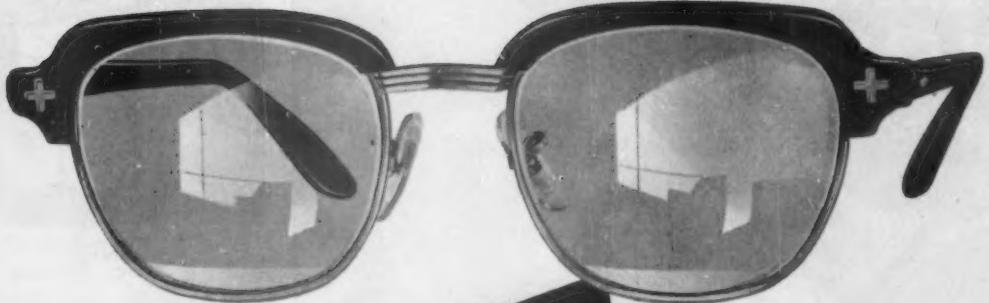
COMPLETE LINE OF MARKAL COATINGS for all kinds of extreme industrial applications . . . widely used, economical, thoroughly proved in service, dependable. Write on your letterhead for complete literature, indicate the nature of your requirements.

**Markal COMPANY**

3111 West Carroll Avenue

Chicago 12, Illinois

For More Information Write No. 661 on Inquiry Card—Page 34



## TO BE SAFE! A good part of C-20 Safety Frame protection lies in its smart looks

Workers will wear it, not tuck it in a pocket. Rich brown plastic top rims provide smart brow accent, with the same plastic continued in the temples, spatula or cable, for added style and comfort.

But don't let C-20's looks fool you! Clearly identified as a safety frame by its cross-shaped plaques, it's as tough as they come. The nickel-silver front, with extra strength built into the critical bridge and endpiece areas, provides the maximum in frontal protection. Sturdy deep-grooved eyewires completely encircle lenses to hold them securely. Redy-Fit side shields are

easily attached to modify C-20 for additional protection.

Here are all the features you and your workers want in a safety frame: smart neat appearance, long-wearing comfort, superior fitting qualities, unequalled strength, outstanding protection. To see samples, call your B&L supplier, or write: Bausch & Lomb, 90605 Lomb Park, Rochester 2, New York.

BAUSCH & LOMB



**Protection PLUS  
Safety Products**

protection + economy + worker acceptance



SEE a demonstration by a specialist

## "PENETRATING CLEANLINESS"

A complete washroom program



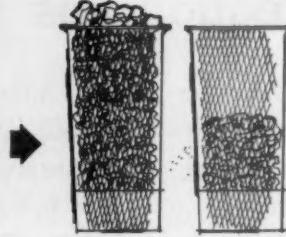
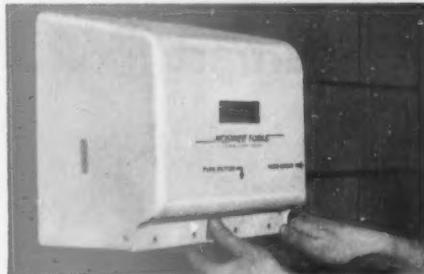
for FREE demonstration or literature address:

WEST CHEMICAL PRODUCTS INC., 42-24 West St., Long Island City 1, N. Y.  
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

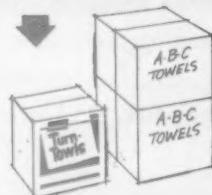
For More Information Write No. 663 on Inquiry Card—Page 34



## MOSINEE TURN-TOWLS *produce hidden cost savings*



**Less Maintenance Cost**  
Turn-Towl cabinet control cuts  
towel consumption 50%!



### Less Storage Space

One case of Turn-Towls  
goes as far as four cases  
of ordinary towels!

Write for the name of your nearest distributor



For More Information Write No. 664 on Inquiry Card—Page 34

### Penetrant Speeds Dismantling 40%



The R. K. Askew Co., Chattanooga, Tenn., which rebuilds woodworking machinery, has found that it saves almost 40% in dismantling time as well as many broken parts by a routine application of FRE-EZE super penetrant before attempting to tear down any machine. Much time is also saved in reassembling because penetrant cleans and lubricates threads.

Write No. 766 on Inquiry Card—Page 34

### Wiping Cloth Dispenser Cuts Towel Loss

When Lynch Corp. tried a Texel shop towel dispenser, it found wiping cloth losses curtailed to less than 1%. The machinery manufacturer also reports efficiency increased because towel exchange time was cut by installing dispenser near work areas to avoid walk to tool crib. The dispensers, which accept five soiled cloths and deliver five clean ones, are manufactured by the Industrial Wiping Cloth Co., Inc., Cleburne, Texas.

Write No. 767 on Inquiry Card—Page 34

### Solves \$60,000-a-year Floor Repair Problem



The Norton Co., Worcester, Mass. spent over \$60,000 each year for floor surface repairs. Materials handling equipment combined with abrasives used in

production cause rapid floor wear. Now the company is using heavy-duty concrete topping installed by the Kalman Floor Co.'s absorption process. In three years the Kalman topping shows no evidence of wear in areas where other floors needed some repair after an equal time in service.

Write No. 768 on Inquiry Card—Page 34

**Protects Hearing  
Without Isolation**



Saving the cost and inconvenience of sound absorption booths, Oneida Ltd., Sherill, N.Y., uses Willson's Sound Barrier to protect employees' hearing from plant noise. Ear muff type sound attenuator is fluid filled and can be worn with glasses if necessary.

Write No. 769 on Inquiry Card—Page 34

**Safety Shield  
Avoids Switch Hazards**



A New England utility is using American Optical H5 face and chest shield to gain maximum protection for workers pulling high-voltage switches. Accidents resulting from sparks flying on head, back of neck, or onto chest have been eliminated with helmet which is high in dielectric strength and impervious to sparks and chemicals.

Write No. 780 on Inquiry Card—Page 34

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THE BALL THAT COUNTS!**



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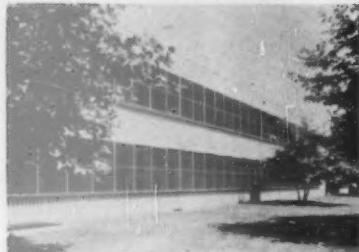
For More Information Write No. 665 on Inquiry Card—Page 34

### Die Casting Firm Saves on Repacking

Prior to switching to Palmetto rings from Greene, Tweed & Co., the Mount Vernon Die Casting Co. used two packing cups per piston, and found it necessary to repack weekly. G-T ring now in use far outperforms the cup assembly—minimum six months to two years. Elimination of constant repacking of cylinders is estimated to have saved thousands of dollars a year.

Write No. 781 on Inquiry Card—Page 34

### Sun-Shading Screens Save \$22,000

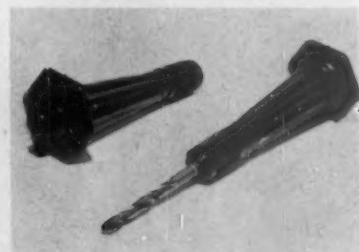


Sun-shading window screens saved the Hughes Aircraft Co. at Culver City, California \$22,000

on air conditioning. Working areas near double rows of windows were uncomfortably warm. KoolShade Sunscreens reduced refrigeration requirements in two buildings from 100 to 80 and from 140 to 115 tons, at approximate initial saving of \$500 a ton. Attractive screens are miniature venetian blinds which screen out 87% of the sun's rays. Non-corrosive, they need not be removed in winter.

Write No. 782 on Inquiry Card—Page 34

### Duct Fastening Time Cut by One-Third

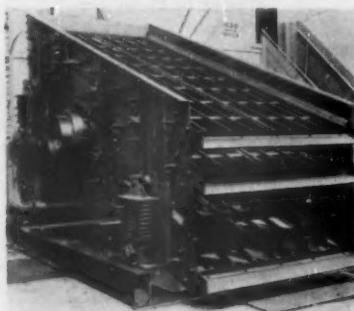


Using Shure-Set hammer-in tools, the Ledbetter Electric Co. of St. Louis was able to set 4000 drive pins and threaded studs in

one-third less time than by conventional methods. The contractor used the combination masonry drill-holder and hammer-in tool on a recent construction project to set fasteners for sub-floor electrical duct work.

Write No. 783 on Inquiry Card—Page 34

### Extra Wide Screens Save Space



Extra wide vibrating screens can replace several smaller ones and provide a simpler installation at lower cost. The Camp Concrete Rock Co. uses four Allis Chalmers Ripl-Flo screens because wide screens minimize new demands on floor space. Company reports that maintenance is also reduced because one large screen has fewer wear parts than several small ones.

Write No. 784 on Inquiry Card—Page 34

### Coagulates Improve Water Clarification, Cut Cost



O'Donnell Woolen Mills, Farmingtonville, Mass., experienced difficulty controlling pastel shades because of high organic color and detergent content of river water supply. Increased alum dosage was ineffective. By switching to Hagan coagulant aids, the plant was able to reduce alum feed by 25% and at the same time improve floc formation and color removal during clarification.

Write No. 785 on Inquiry Card—Page 34

## TROUBLE-FREE PAPER TOWEL CABINET

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TOWELS



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For More Information Write No. 666 on Inquiry Card—Page 34

**Grinding Fluid Reduces  
Machine Time**



On many heavy duty grinding operations with tough materials, Cimperial, a water solution grinding fluid, can reduce grinding time and improve the overall grinding action. One customer switched from a soluble oil to Cimperial and reduced the time required for surface grinding large sulfur bronze plates from 4 hours to 2½ hours. Cimperial was used at a dilution of 1 part concentrate with 60 parts of water.

Write No. 786 on Inquiry Card—Page 34

**Nylon Sleeves Cut  
Repair Time 75%**



Arbor repair and replacement on printing and coating machines for aluminum tubes required 20 hours a week at the Atlas Collapsible Tube Co., Chicago, Ill. By changing from phenolic to molybdenum disulphide filled nylon arbors, the time was reduced by more than 75%. Less down-time also increased production. Arbors machined from filled nylon bearing stock, manufactured by the Polymer Corp., lasted four times as long on printers, twice as long on coating machines.

Write No. 787 on Inquiry Card—Page 34  
MAY 23, 1960

**you can't expect to make  
a hole-in-one with a putter!**



**you can't expect to have the  
best shelving unless it's**

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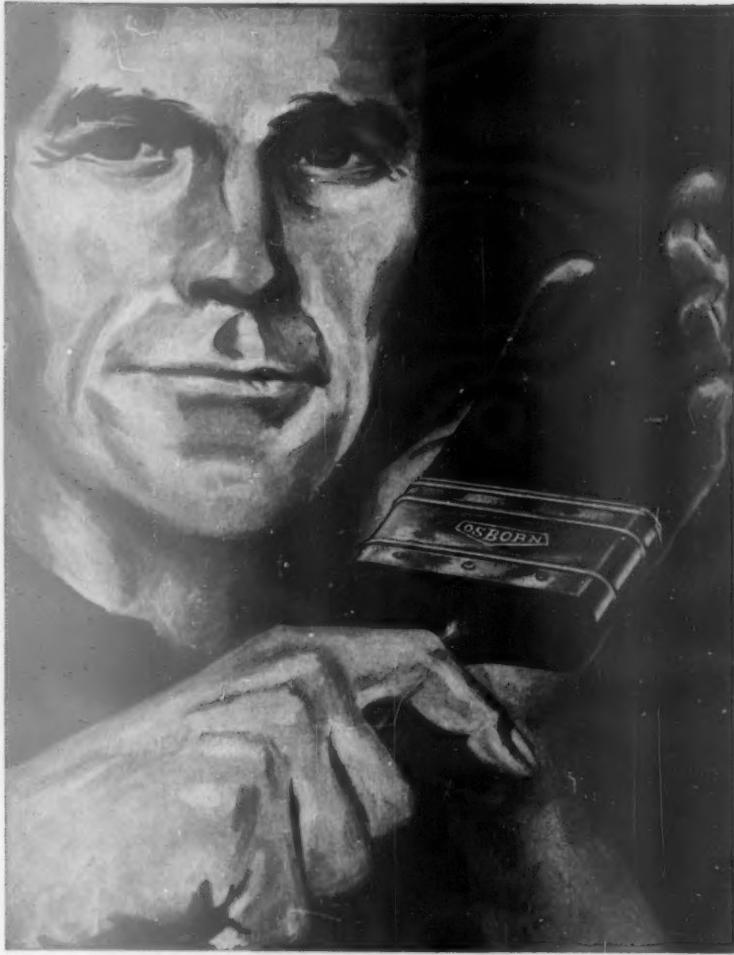
and then Tilt shelf into support  
brackets . . . and shelf  
is ready for loading.

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For More Information Write No. 667 on Inquiry Card—Page 34



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OSBORN

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For More Information Write No. 668 on Inquiry Card—Page 34

Today's industrial buyer is a special kind of expert. His job: spot and buy genuine value down the line—big purchase or small. And when it comes to brushes—both the men who buy and the men who use them agree on Osborn.

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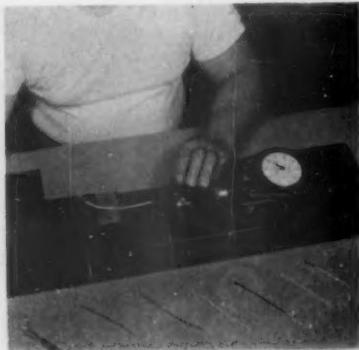
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*Osborn Brushes*

## Tensile Tester Reduces Customer Complaints



Vendor - customer misunderstandings frequently arose because tensile capabilities among similar connectors and solderless terminals vary. Malco Manufacturing Co., Chicago, is now using a Hunter terminal pull tester to check the tensile strength of connectors. Customers complaints have dropped to a minimum.

Write No. 788 on Inquiry Card—Page 34

## 50% Savings in Athlete's Foot Ban



Using a new Onox Footsprayer for prevention of athlete's foot in shower areas, the Central Division of Northern Illinois Gas Co. made savings in labor, maintenance and use of solution. Employee steps on Footsprayer like a bathroom scale, and each foot receives a thorough spray. Made of fiberglass and high-density polyethylene, Footsprayer is easy to keep clean, does not require daily maintenance. One filling takes care of 3000 bathers.

Write No. 789 on Inquiry Card—Page 34

## Plunger Can Dispenses Toxic Solvent Safely

Trichlorethylene is used to remove residual solder flux at Sperry Rand's Univac Division. Formerly, solvent was kept in

open glass jars with resulting hazards from evaporation, splashing and spilling. Today, Protectoseal plunger cans dispense liquid as



needed without danger of spilling. Excess solvent flows back into can automatically and opening is sealed to prevent evaporation.

Write No. 790 on Inquiry Card—Page 34

**Outside Level Control Costs Less to Install**



A major processing plant is saving installation and maintenance costs with a tank control that is mounted on the outside of the tank and eliminates contact of components with material within the tank. Exterior mounting of two units, a source and a detector, avoids cutting into walls. There is no physical contact with stored material to corrode parts.

Write No. 791 on Inquiry Card—Page 34

**Steam Traps Reduce Down Time, Raise Output**

At the Stokes Molded Products plant in Trenton, an important step in producing molded rubber battery containers and parts in curing of finished products in vulcanizers heated by steam at 60 psi. Dissatisfaction with steam

(Please turn to page 520)

Binks Airless spraying outfits are available for pumping paints direct from 55- or 10-gallon shipping containers to spray guns.



# Facts you should know about Airless spraying

**Q: Is airless atomization spraying the answer to all spray painting and coating problems?**

**A:** No! Not by a long shot.

**Q: Where, then, is airless spraying best used?**

**A:** It is excellent for indoor and outdoor painting maintenance or production work because there is virtually no overspray.

**Q: Does Binks manufacture airless spraying equipment?**

**A:** Yes. These rugged, dependable and mobile outfits incorporate the latest developments.

**Q: Why see Binks first when thinking of airless equipment?**

**A:** Binks offers you a complete line of spraying equipment. Only Binks offers you the opportunity to objectively compare airless with other techniques to select the equipment best suited to your requirements. Binks engineering assistance on finishing problems is likewise completely objective.

**Q: How can more facts be obtained on Binks airless units?**

**A:** Ask your Binks industrial distributor for Binks Bulletin A98-7. Or, call your nearest Binks Branch Office or write direct.

9629

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For More Information Write No. 669 on Inquiry Card—Page 34

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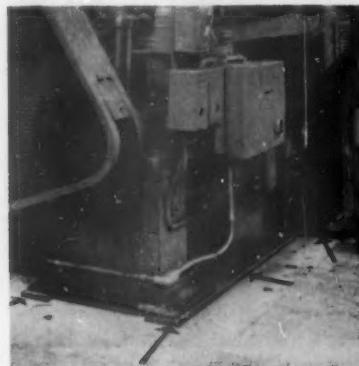
world's standard of safety since 1906

For More Information Write No. 670  
on Inquiry Card—Page 34

520

(Continued from page 519)  
traps in eleven continuously used vulcanizers led to a switch to Sarco Thermo-Dynamic steam traps. Since then Stokes reports

system has enabled the Allen Manufacturing Co. to streamline its entire installation when it moved over 600 pieces of machinery into a new plant. Uni-



that performance has been continuous and previously troublesome down time has been cut to the barest minimum.

Write No. 792 on Inquiry Card—Page 34

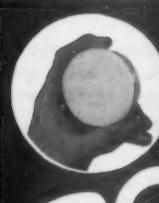
### Sound Absorbing Mounts Cut Installation Costs

A Unisorb machine mounting

sorb made it unnecessary to drill holes in floor or bolt machines in place, saving several dollars per machine. In addition to reducing noise and vibration, it provided flexibility in placement. The mounts are expected to last as long as the machines themselves.

Write No. 793 on Inquiry Card—Page 34

For all-round deodorizing...



# ROUNDS

Fragrant, laborless  
deodorant discs for urinals,  
bowls, garbage pails, lockers, closets

Deodoroma ROUNDS cost in use averages only a fraction of one cent a day. Rounds are formed under 70,000 pounds pressure; are dense and durable. Fragrance is locked in: lasts until the last particle has vaporized—there's no harsh "moth cake odor." Packed eight to the telescoping box—each Round sealed airtight—easy-to-shape Holzit wire holder in every box. For literature write to The C. B. Dolge Company, Westport, Conn.

For free sanitary survey  
of your premises ask  
your Dolge service man

**DOLGE**  
WESTPORT, CONNECTICUT

For More Information Write No. 671 on Inquiry Card—Page 34

PURCHASING

**Corrosion Inhibitor  
Saves Fuel**



Whippany Paper Board Co. now saves 180 lbs. of coal for each ton of paper board produced since using a corrosion inhibitor made by Hagan Chemicals & Controls, Inc. Steamline maintenance has been reduced 60% by adding Hagafilem to boiler feedwater. Material forms a thin protective film on all metal surfaces contacted by condensate. By purging old corrosion deposits the product has increased surface temperatures by 20 degrees and improved heat transfer.

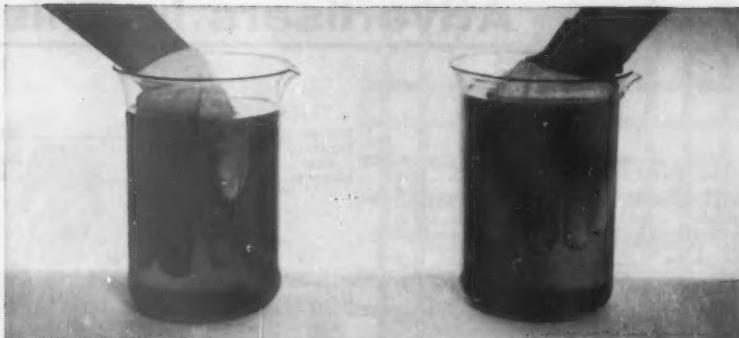
Write No. 794 on Inquiry Card—Page 34

**Safety Glasses Reduce  
Eye Injuries by 82%**



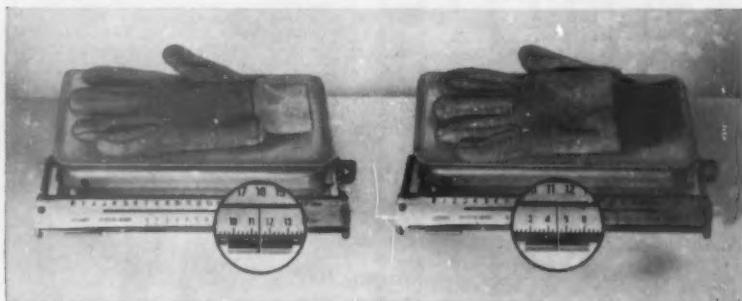
For the last seven years Eastman Kodak has carried out an expanded eye safety program which has reduced eye injuries 82%. Safety eyewear from Bausch & Lomb protects all personnel in dangerous work in the Apparatus & Optical Div. Most common hazard comes from flying chips, but in nine instances a broken tool bit has shattered a safety glass lens, without harming the wearer's eyes.

Write No. 795 on Inquiry Card—Page 34  
MAY 23, 1960



Here is an untreated terry cloth glove being soaked in oil.

Here is an oil-repellent Oilmac glove getting the same treatment.



Now we weigh the untreated glove. It is oil soaked and soggy, weighs a full 11 1/2 ounces. Not very comfortable to wear!

But the Oilmac has only surface oil, weighs a mere 4 1/2 ounces. Both gloves weighed 2 1/2 ounces before being immersed.

## **Proof: Untreated gloves soak up oil...new Oilmacs stay light, comfortable!**

Now you've seen it! Specially treated Oilmacs really repel oil . . . stay light, comfortable, flexible even after soaking in oil. Mind you, there's nothing wrong with the untreated gloves: we sell carloads of them, and they are fine for most applications. But where oil is a problem, Oilmacs are the an-

swer! Moreover, new Oilmacs are far more cut resistant than expensive leather gloves . . . can be reconditioned with virtually no loss in oil resistance . . . and are interchangeable, so any two make a pair, any pair gives you four working surfaces. Write today for literature about these new work gloves by Jomac!

*Jomac also makes a complete line of  
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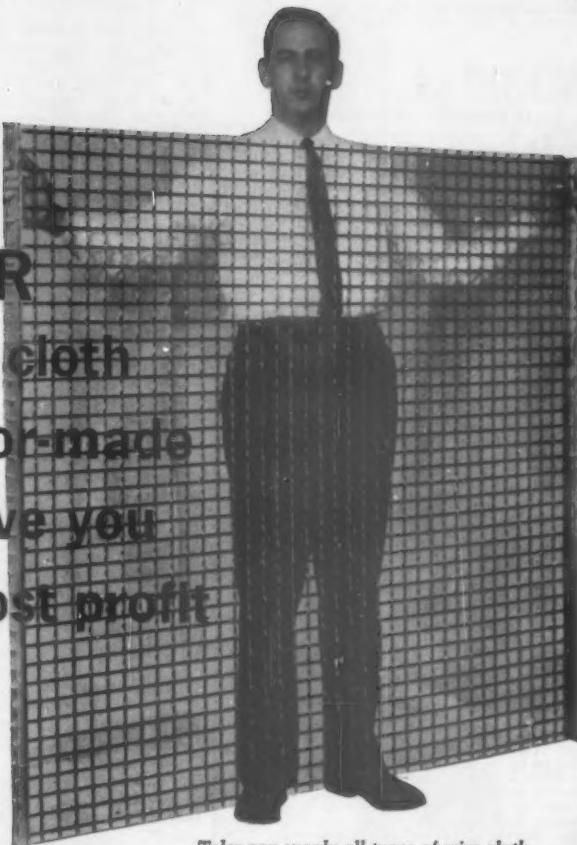
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**to give you**  
**the most profit**



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Tyler does more than manufacture 53,000 different specifications of wire cloth. It starts by designing the specifications to solve each problem to your greatest profit.

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Ask your Tyler representative for full information—through him you'll get *Tyler Screening Service*.

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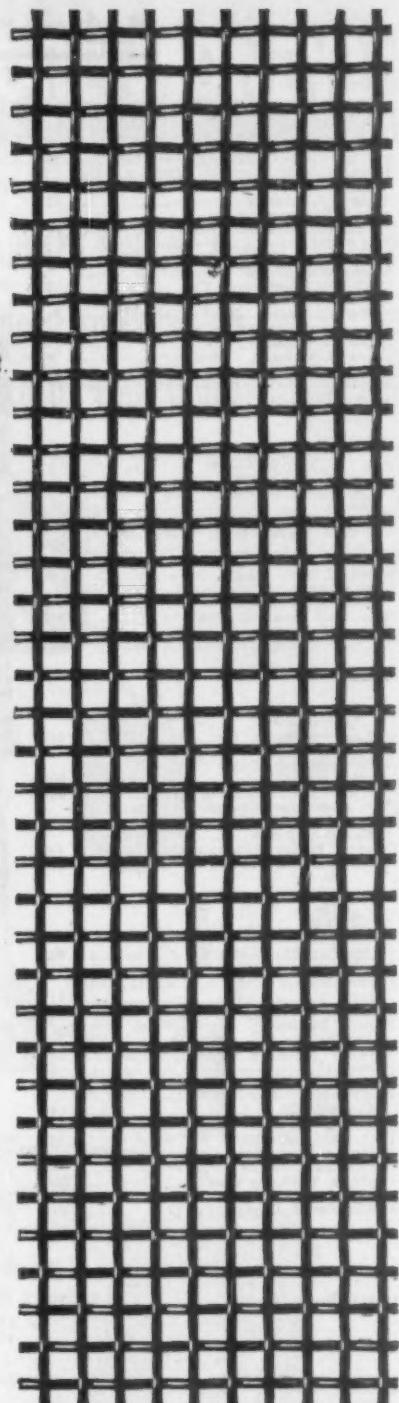
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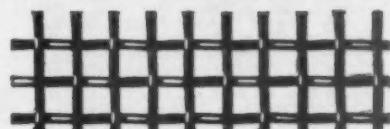
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**TYLER**



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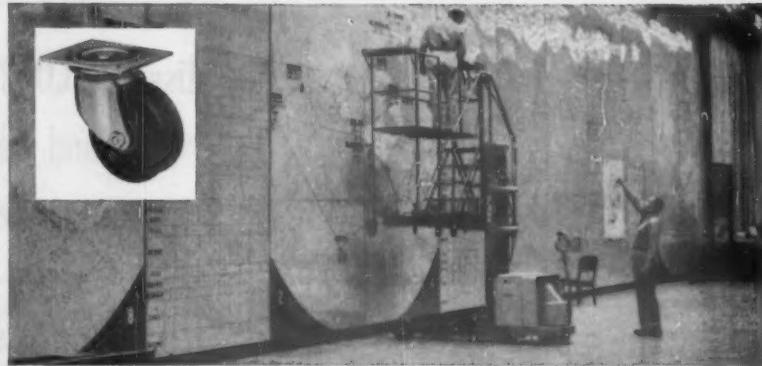
# MATERIALS-HANDLING NEWS

NEW AND UNUSUAL APPLICATIONS OF BASSICK CASTERS THAT MIGHT BE ADAPTED TO YOUR HANDLING PROBLEMS

## THIS CASTER GUIDES FLOATING ROOF OF OIL STORAGE TANK



Constant movement plus submersion in oil doesn't bother these Bassick casters and wheels. They're used on the roof of 67,000 barrel tank at the Tidewater Oil Tank Storage Farm in San Pedro, California. There's another Bassick wheel *inside* the tank mounted on pontoons that *float* to the top when the tank is full and help center the floating roof. This is typical of the way Bassick quality wheels and casters solve problems saving time, money and work.



## The Strategic Air Command Where Fighting Facts Move on Bassick Casters!

At the Strategic Air Command's \$10,000,000 Control Center, giant map panels (8 ft. x 20 ft.) roll quickly and smoothly on Bassick Grooved Wheel Casters. Weather information, operational facts, plans, all the vital information needed to direct global forces in peace or war goes where it's wanted . . .

when it's wanted. Bassick grooved wheel casters and angle iron track offer a basic, unique, inexpensive and flexible means of moving engines, tools, parts and finished products at low cost. Simple means of movement through assembly lines or into and out of warehouse.

## KING COTTON FLOATS TO MARKET ON BASSICK CASTERS

For 10 years, the Joanna Mills in South Carolina have moved giant 700 pound bales of cotton around like so many empty cardboard boxes. The real work is done by 33 dollies equipped with Bassick Floating Hub Casters. They have increased speed of movement by 35% and absorb the shock when bales slide down chute to waiting dollies. Saves time and makes work easier for employees.



SEALED  
BEARINGS  
DEFY DIRT AND  
MOISTURE



### Lubrication seals prevent dripping grease . . . avoids hazards

This is a beauty! Special lubrication seals on Bassick casters keep floors clean by eliminating the hazards of dripping grease. Seals are engineered to remain effective for the life of the caster. They can be easily flushed and new grease added without disassembly.

### Ask Your Distributor!

Local industrial distributors carry popular Bassick models in stock. They will be glad to recommend the most efficient caster to solve your materials handling problems.

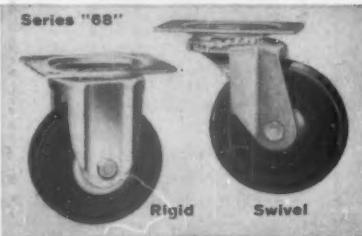
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BRIDGEPORT 5, CONN.  
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A DIVISION OF  
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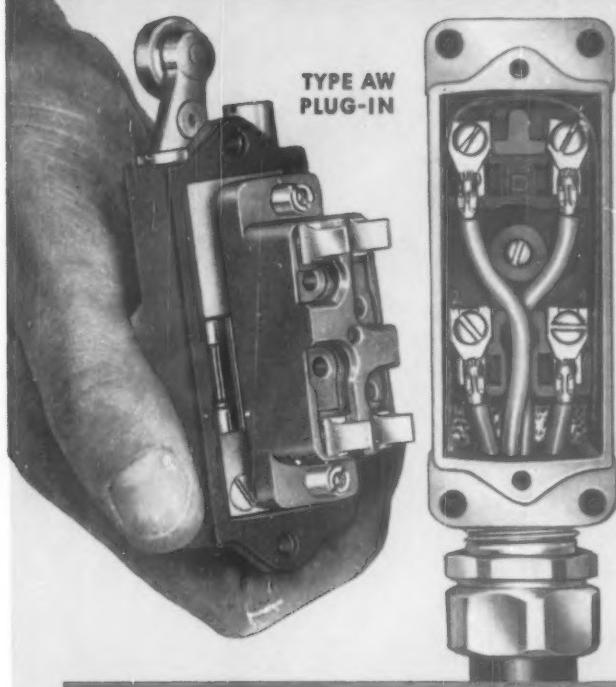


## STORES AND WAREHOUSES SAVE TIME AND MONEY WITH THIS CASTER



These Bassick Diamond Arrow Casters feature the highest quality steel and unique, two-level ball race for easiest swiveling. Economical and versatile, they are ideal for light duty where load capacities range from 100 to 250 lbs. They give quiet, easy action to light-duty trucks, service trucks, dollies and similar equipment. Attachments such as special stems, wide wheels and side brakes make this series particularly adaptable for many different uses. 0.31

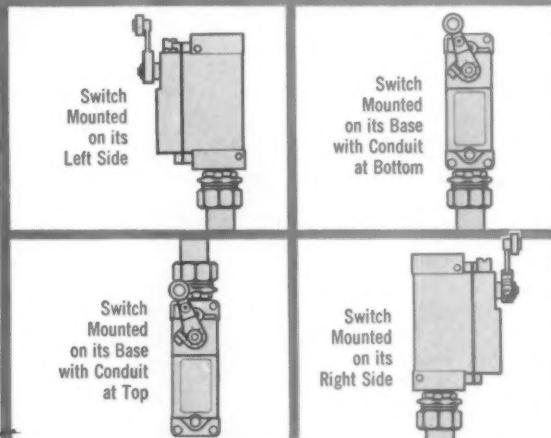
# This New *PLUG-IN* LIMIT SWITCH is SO EASY to Use!



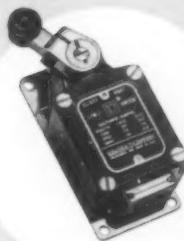
TYPE AW  
PLUG-IN

- Oil-tight construction
- Switch plugs in—in seconds
- Mounts without disassembly
- Wired without removing from box
- Reversible plug-in unit—can be plugged-in with roller arm at either end
- Switch action can be reversed by simple screwdriver adjustment
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- Precision switch mechanism—only 5° to operate—25° overtravel in either direction
- Graduated markings around hub of roller arm simplify accurate settings
- Same price as standard Square D oil-tight limit switch

## 6 MOUNTING ARRANGEMENTS—WITH 1 DEVICE!



In any of the above arrangements, conduit can enter at either top or bottom by reversing box position



## HEAVY-DUTY TYPE T OIL-TIGHT LIMIT SWITCH

has eleven contact arrangements in one switch. Arms continuously adjustable. Up to 80° overtravel. All switches are interchangeable, easy to mount. Separate packaging of lever arms and switches for simplified stocking.

*Write for BULLETIN 9007 AW to Square D Company,  
4041 North Richards Street, Milwaukee 12, Wisconsin*



**SQUARE D COMPANY**

*wherever electricity is distributed and controlled*

For More Information Write No. 403 on Inquiry Card—Page 34

Landmark on The American Road

# FORD Motor Company Central Office Building



950,000 square feet of ultra-modern office facilities for 3,500 employees, including a cafeteria seating 638 and auditorium for 500.

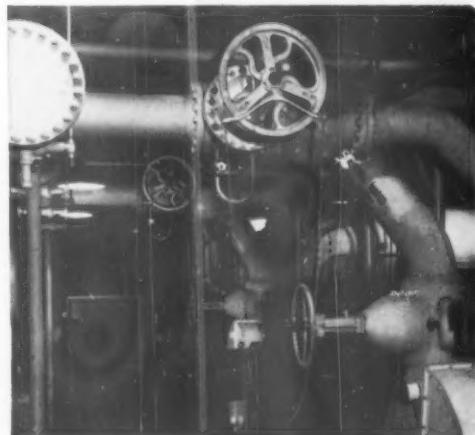
## equipped with **JENKINS VALVES**

because efficiency is a part of the over-all design

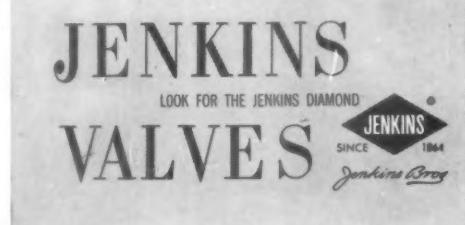
**Beauty, comfort, efficiency** — Keynote in the planning of Ford cars, this combination also was sought and clearly achieved in the Central Office Building of Ford Motor Company, Dearborn, Michigan.

With efficiency a part of the over-all design it is not surprising to see Jenkins Valves on the plumbing, heating and air conditioning pipelines in this superb building. For almost a century the name JENKINS has meant reliability . . . valves with the enduring quality to last the life of a building. It will pay you to have this important assurance when you specify or install valves, especially since Jenkins Valves cost no more. Jenkins Bros., 100 Park Ave., N.Y.17.

Sold Through Leading Distributors Everywhere



Jenkins Valves on chill water and condenser lines serving Ford building's 2,200-ton air-conditioning system



For More Information Write No. 404 on Inquiry Card—Page 34



# JUSTRITE

...America's greatest name in  
**SAFETY CANS** and  
**OILY WASTE CANS**



"JUSTRITE" on a safety can or oily waste can is positive assurance of protection. Millions of these carefully designed and engineered cans are in use in thousands of plants all over the United States. Reduce fire hazards due to benzine, oily rags and waste. JUSTRITE Safety Cans are the finest cans for use for flammable or highly volatile liquids. Both types of JUSTRITE cans are Underwriters' Laboratories and insurance companies' approved.

## FREE!

Send today for your copy of the bulletin showing the Justrite Safety Benzine Cans, Oily Waste Cans and Plunger Cans.

**JUSTRITE**  
MANUFACTURING COMPANY  
2061 NORTH SOUTHPORT AVENUE  
CHICAGO 14, ILLINOIS

world's standard of safety since 1906

For More Information Write No. 670  
on Inquiry Card—Page 34

520

(Continued from page 519)  
traps in eleven continuously used vulcanizers led to a switch to Sarco Thermo-Dynamic steam traps. Since then Stokes reports

system has enabled the Allen Manufacturing Co. to streamline its entire installation when it moved over 600 pieces of machinery into a new plant. Uni-



that performance has been continuous and previously troublesome down time has been cut to the barest minimum.

Write No. 792 on Inquiry Card—Page 34

## Sound Absorbing Mounts Cut Installation Costs

A Unisorb machine mounting



sorb made it unnecessary to drill holes in floor or bolt machines in place, saving several dollars per machine. In addition to reducing noise and vibration, it provided flexibility in placement. The mounts are expected to last as long as the machines themselves.

Write No. 793 on Inquiry Card—Page 34

For all-round deodorizing ...



# ROUNDS

Fragrant, laborless  
deodorant discs for urinals,  
bowls, garbage pails, lockers, closets

Deodoroma ROUNDS cost in use averages only a fraction of one cent a day. Rounds are formed under 70,000 pounds pressure; are dense and durable. Fragrance is locked in; lasts until the last particle has vaporized—there's no harsh "moth cake odor." Packed eight to the telescoping box—each Round sealed airtight—easy-to-shape Holzit wire holder in every box. For literature write to The C. B. Dolge Company, Westport, Conn.

For free sanitary survey  
of your premises ask  
your Dolge service man

**DOLGE**  
WESTPORT, CONNECTICUT

For More Information Write No. 671 on Inquiry Card—Page 34

PURCHASING

# PURCHASING

The Methods and News Magazine for Industrial Buyers

PURCHASE ORDER NO.

**Corrosion Inhibitor  
Saves Fuel**



Whippany Paper Board Co. now saves 180 lbs. of coal for each ton of paper board produced since using a corrosion inhibitor made by Hagan Chemicals & Controls. Steamline maintenance has been reduced 60% by adding HagaFilm to boiler feedwater. Material forms a thin protective film on all metal surfaces contacted by condensate. By purging old corrosion deposits the product has increased surface temperatures by 20 degrees and improved heat transfer.

Write No. 794 on Inquiry Card—Page 34

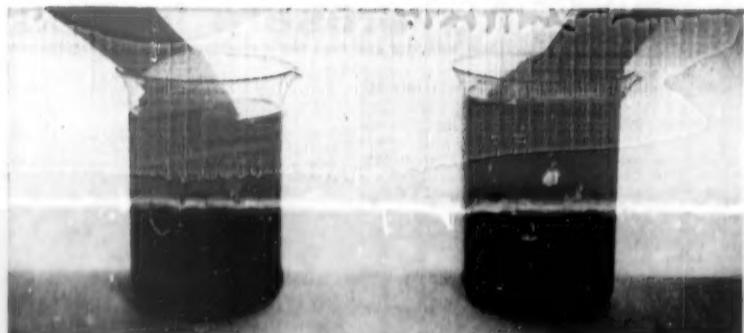
**Safety Glasses Reduce  
Eye Injuries by 82%**



For the last seven years Eastman Kodak has carried out an expanded eye safety program which has reduced eye injuries 82%. Safety eyewear from Bausch & Lomb protects all personnel in dangerous work in the Apparatus & Optical Div. Most common hazard comes from flying chips, but in nine instances a broken tool bit has shattered a safety glass lens, without harming the wearer's eyes.

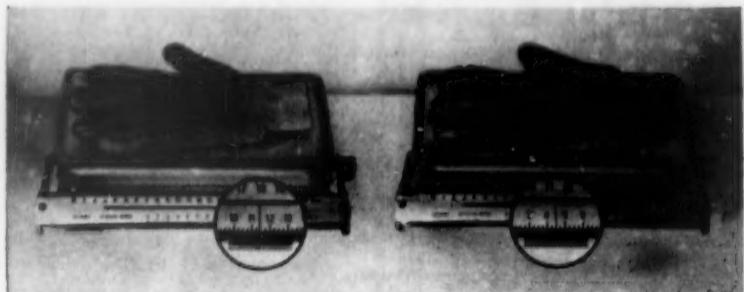
Write No. 795 on Inquiry Card—Page 34

MAY 23, 1960



Here is an untreated terry cloth glove being soaked in oil.

Here is an oil-repellent Oilmac glove getting the same treatment.



Now we weigh the untreated glove. It is oil soaked and soggy, weighs a full 11½ ounces. Not very comfortable to wear!

But the Oilmac has only surface oil, weighs a mere 4½ ounces. Both gloves weighed 2½ ounces before being immersed.

## Proof: Untreated gloves soak up oil...new Oilmacs stay light, comfortable!

Now you've seen it! Specially treated Oilmacs really repel oil . . . stay light, comfortable, flexible even after soaking in oil. Mind you, there's nothing wrong with the untreated gloves: we sell carloads of them, and they are fine for most applications. But where oil is a problem, Oilmacs are the an-

swer! Moreover, new Oilmacs are far more cut resistant than expensive leather gloves . . . can be reconditioned with virtually no loss in oil resistance . . . and are interchangeable, so any two make a pair, any pair gives you four working surfaces. Write today for literature about these new work gloves by Jomac!

Jomac also makes a complete line of  
North PVC Coated Gloves and Wet Weather Garments

**JOMAC**  
Jomac Inc., Dept. F  
Philadelphia 38, Pa.

"Jomac Sells Quality...and Quality Sells Jomac!"  
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wire  
is tailored  
to give  
the most



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— and screen sections fabricated to fit  
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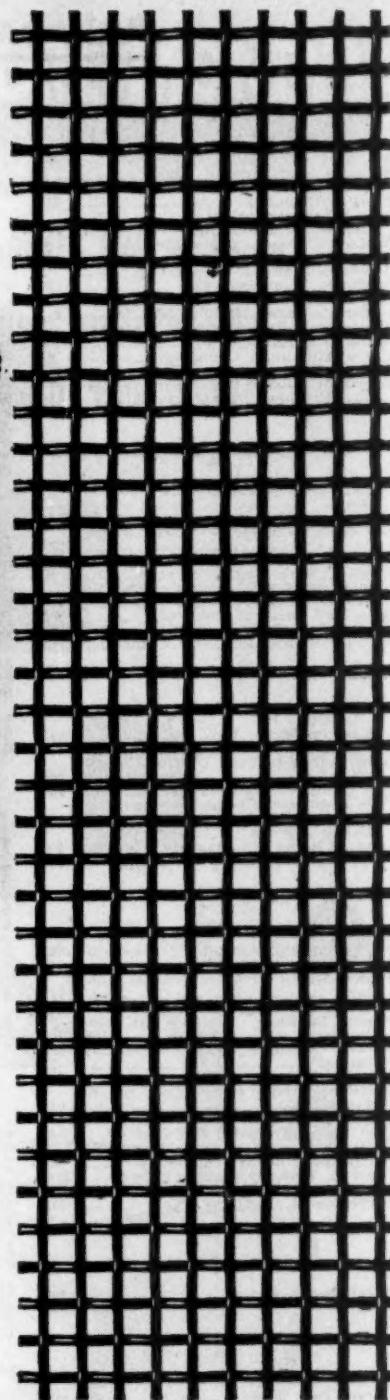
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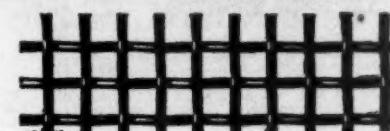
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**TYLER**



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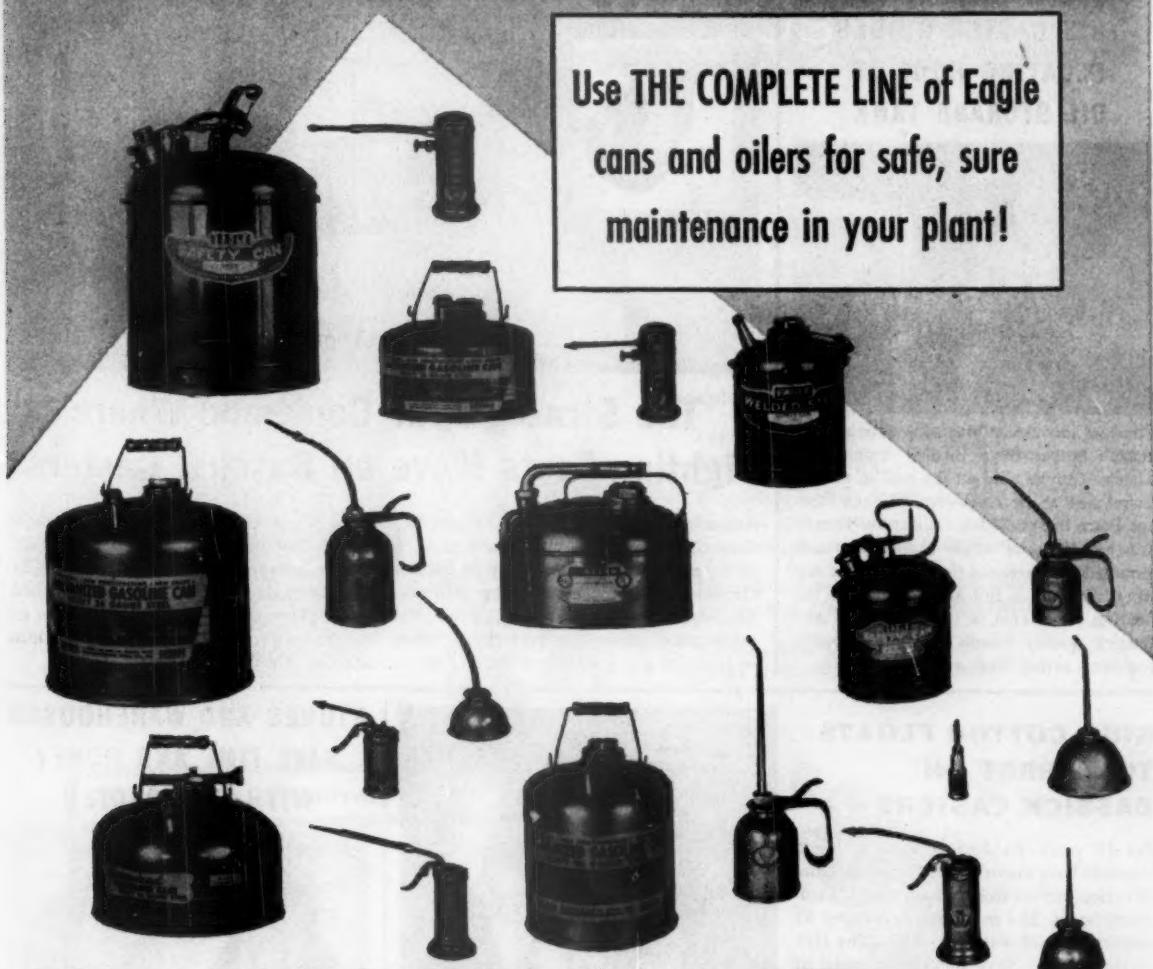
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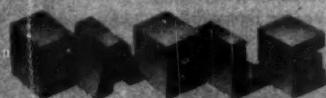
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Constant movement plus submersion in oil doesn't bother these Bassick casters and wheels. They're used on the roof of 67,000 barrel tank at the Tidewater Oil Tank Storage Farm in San Pedro, California. There's another Bassick wheel *inside* the tank mounted on pontoons that *float* to the top when the tank is full and help center the floating roof. This is typical of the way Bassick quality wheels and casters solve problems saving time, money and work.

## KING COTTON FLOATS TO MARKET ON BASSICK CASTERS

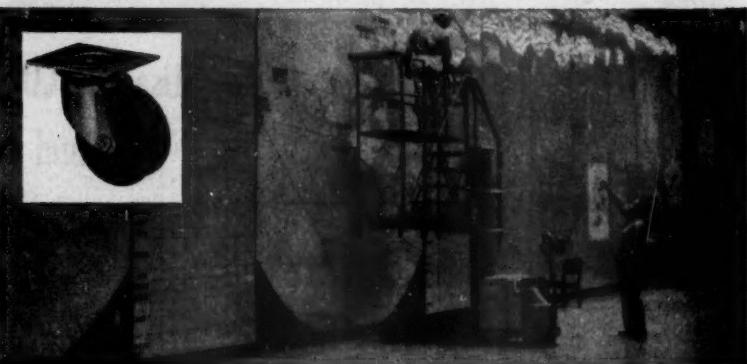
For 10 years, the Joanna Mills in South Carolina have moved giant 700 pound bales of cotton around like so many empty cardboard boxes. The real work is done by 33 dollies equipped with Bassick Floating Hub Casters. They have increased speed of movement by 35% and absorb the shock when bales slide down chute to waiting dollies. Saves time and makes work easier for employees.

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Local industrial distributors carry popular Bassick models in stock. They will be glad to recommend the most efficient caster to solve your materials handling problems.

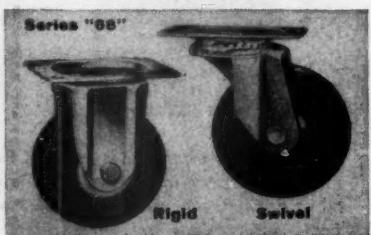


## The Strategic Air Command Where Fighting Facts Move on Bassick Casters!

At the Strategic Air Command's \$10,000,000 Control Center, giant map panels (8 ft. x 20 ft.) roll quickly and smoothly on Bassick Grooved Wheel Casters. Weather information, operational facts, plans, all the vital information needed to direct global forces in peace or war goes where it's wanted...

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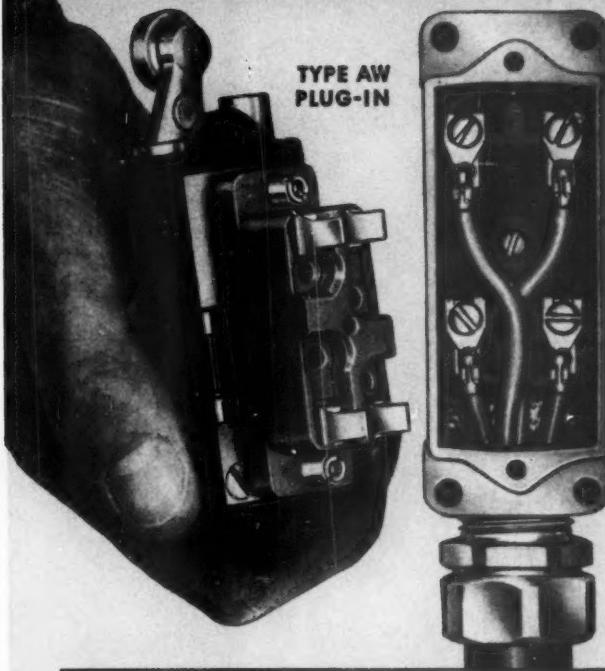
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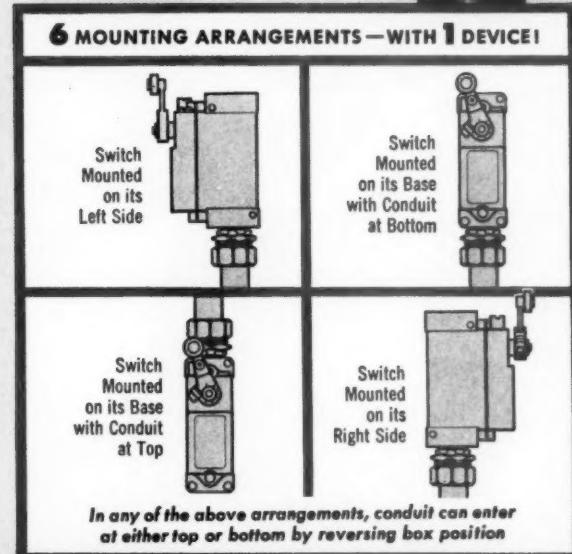
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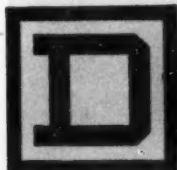
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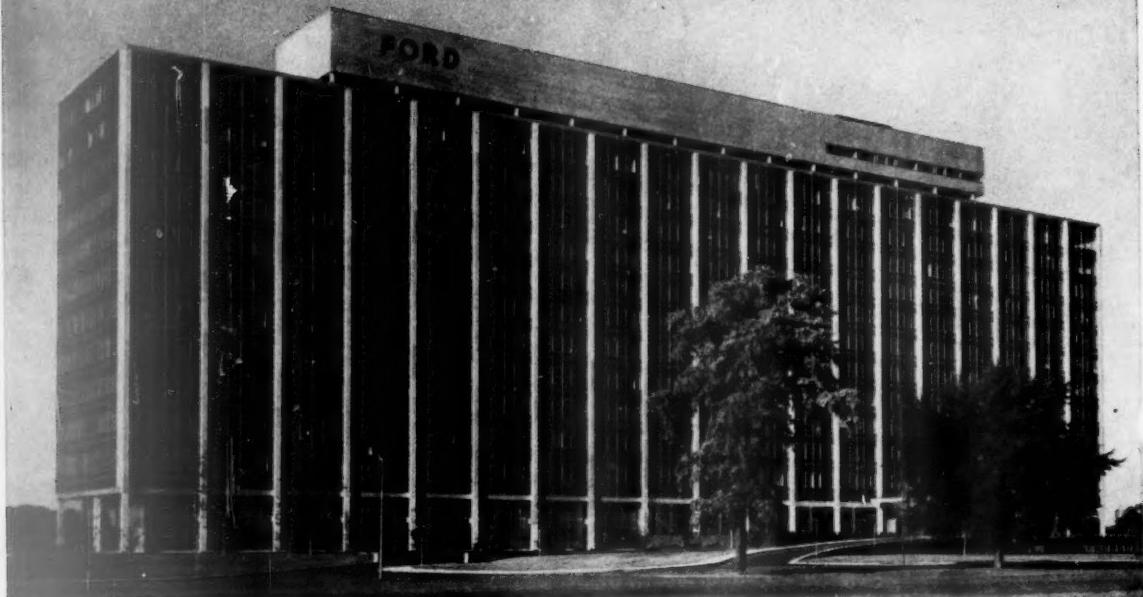
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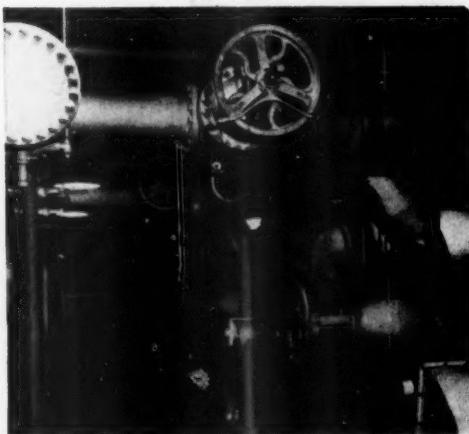
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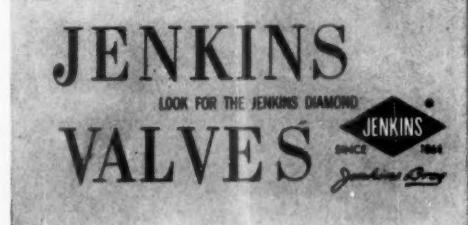
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